SONIC®

USER GUIDE

BD AUTHORING

SCENARIST®

THE PROFESSIONAL AUTHORING STANDARD

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Scenarist BD Authoring User Guide — Sonic Part Number 800212 Rev K (09/08)

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1 Introduction & Installation

Welcome to Scenarist BD, a comprehensive authoring system for creating Blu-ray Disc titles. This chapter includes the following introductory topics:

- "About Blu-ray Disc" on page 12
- "System requirements" on page 12
- "Sonic support on the Web" on page 13
- "Installed applications" on page 13
- "Installing Scenarist BD" on page 15

About Blu-ray Disc

Blu-ray Disc (BD) is a 25 GB optical disc format (50 GB for dual layers) developed for the next generation of high-definition movie titles.

Blu-ray Disc includes:

- High Definition Movie mode (HDMV), which offers vastly improved video and audio quality, and expanded interactivity, beyond standard-definition DVD titles.
- High-definition video resolutions (up to 1920 x 1080).
- High-definition surround audio.
- Full-color, independent graphic planes for subtitles and menus, accessible without interrupting movie playback.
- Expanded menu interactivity, including multi-page menus, pop-up menus, animated buttons, and button sounds.
- Improved subtitles, including full-color graphic subtitles and text-based subtitles.
- Browsable slideshows with independent audio playback.
- BD-J mode, which provides support for Java-based interactive movie objects.

System requirements

To use Scenarist BD, you must have a compatible computer with appropriate system software and peripherals. The latest system requirements are available at:
http://www.sonic.com/go/scenarist

Sonic support on the Web

If you have specific questions about using Scenarist BD that aren't answered by the documentation, support is available at:

http://support.sonic.com

Installed applications

The installation process for Scenarist BD loads an entire suite of applications and utilities to your computer. Scenarist BD includes:

- **Scenarist BD**, the primary authoring application. It is introduced in Chapter 2, "Using Scenarist BD," and is featured in most of the other chapters.
- **Scenarist BD-J**, used to create Java-based movie objects. For more information, see "BD-J titles" on page 357; also, see the *Scenarist BD-J Authoring User Guide*.
- **Scenarist Safeguard**, a utility that provides a graphic user interface (GUI) to facilitate JAR signing and security for BD-J applications. For more information, see the *Scenarist Safeguard User Guide*.
- The **MUI Generator**, which processes video and audio streams for use in Scenarist BD. For more information, see "Using the MUI Generator" on page 45.
- The **Still Image Encoder**, a processor that encodes still images as video, so they can be used in Scenarist BD. For more information, see "Using the Still Image Encoder" on page 35.
- The **Audio Interleaver**, a utility that allows you to create self-contained surround sound audio from mono WAV sources. For more information, see "Using the Audio Interleaver" on page 38.
- The **PNG Trimming Tool**, a utility that allows you to trim PNGs (Portable Network Graphics) for use as assets in Scenarist BD.

- **Scenarist Designer PS**, a plug-in for Adobe Photoshop. It normalizes the color palette of Interactive Graphics (IGs), Presentation Graphics (PGs), and graphic asset sets created in Photoshop, then exports files in a format that can be imported directly into Scenarist BD. For more information, see "Importing/updating Designer PS files" on page 325; also, see the *Scenarist Designer PS User Guide*.

  Note: Scenarist Designer PS installs only if you have Adobe Photoshop CS or higher installed on your computer.

- The **Mux Remoting Server**, used with the MUX (multiplexing) tool in Scenarist BD to write the final output streams of an HDMV project. For more information, see "Multiplexing" on page 396.

- The **TS Remoting Server**, the application that is called remotely by the Mux Remoting Server when it is used to distribute the MUX process across multiple systems on the same LAN.

- The **DW Remoting Server**, used with the Download tool in Scenarist BD to create a final CMF output image. For more information, see "Final CMF Output" on page 404.

- The **BDCMF Creator**, which converts the Sony CMF output from Scenarist BD to the BD CMF format used by many replication facilities.

- **Scenarist QC Studio**, a comprehensive emulation and debugging application for professional BD-ROM authors and programmers. For more information, see the *Scenarist QC User Guide*.

- The **DB Converter**, which converts earlier Scenarist HDMV (projects that were created using versions prior to 4.5.1) into a format that can be used by Scenarist BD 5.0 and beyond. For more information, see "Using the DB Converter" on page 70.

- **Scenarist Bridge**, which exports Scenarist BD project files in a compatible format for use by BD-J developers using Ensequence On-Q. For more information, see "Exporting Scenarist BD projects with Scenarist Bridge" on page 378.

Installing Scenarist BD

This section documents how to install the Scenarist BD software, Sentinel dongle drivers, and Sonic dongle. The included dongle must be attached to your computer when running Scenarist BD. (However, *do not* attach the Sonic dongle until after you have installed the Scenarist BD software and Sentinel dongle drivers, as described in the steps below.) When you launch Scenarist BD the first time, you are prompted to activate the program by entering an Activator Code. The Activator Code is emailed to you after Sonic receives your registration information.

To install and activate Scenarist BD:

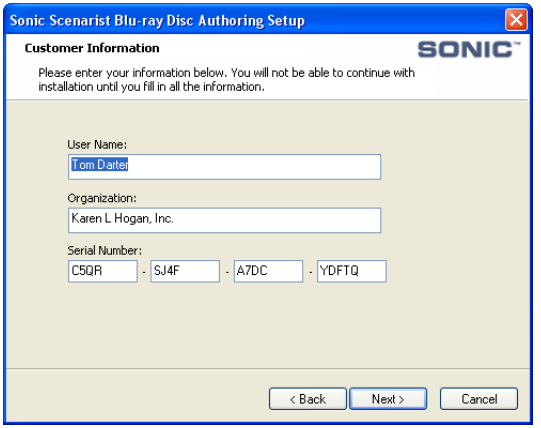
1. Insert the Sonic Installation disc.
2. Open the Scenarist BD Install directory.
3. Double-click the Setup.exe icon.

The Sonic setup wizard appears.

4 Click Next. The License Agreement page appears.

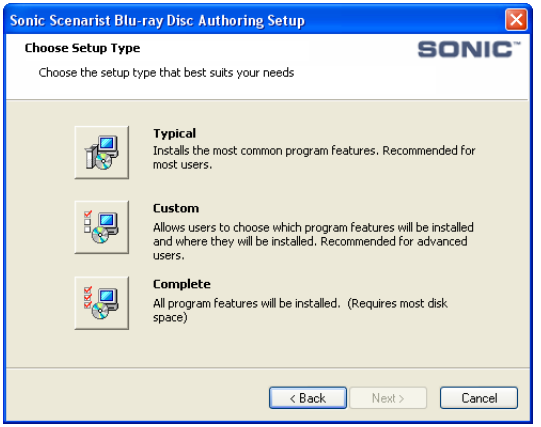
5 Read the License Agreement. To continue with the installation, click the radio button to accept the terms of the agreement.

6 Click Next. The Customer Information page appears.

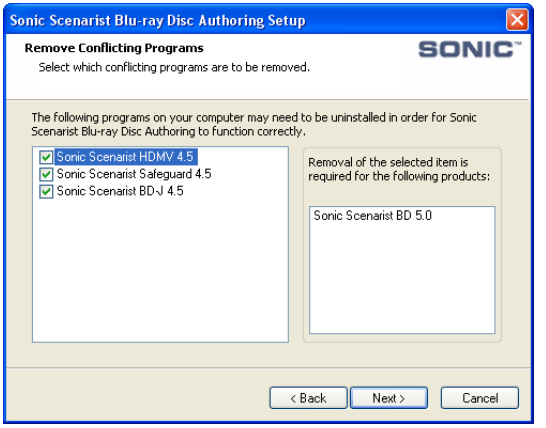


7 If necessary, enter your User Name and Organization details. (The Serial Number field is automatically pre-configured: Do not edit the provided Serial Number.)

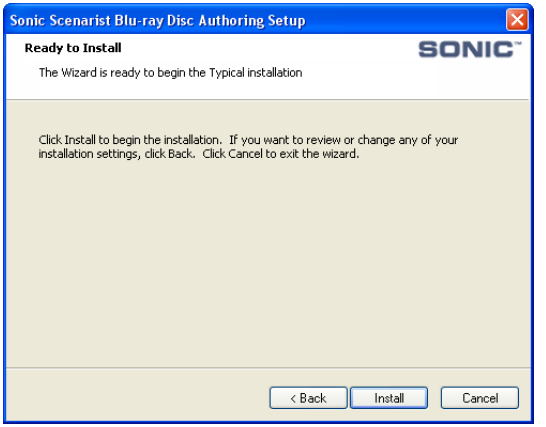
8 Click Next. The Choose Setup Type page appears.



9 Click Typical. The Remove Conflicting Programs page appears.



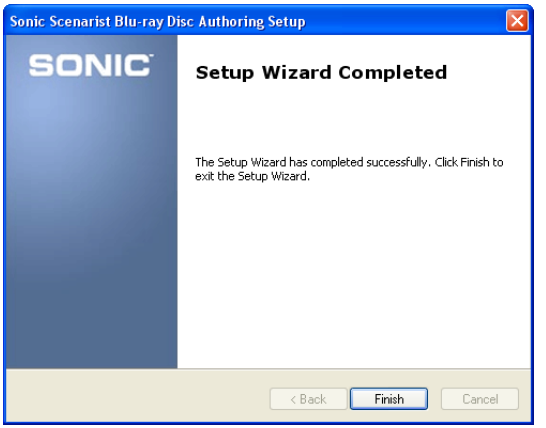
10 Click Next. The Ready to Install page appears.



11 Click Install. The setup wizard begins by uninstalling conflicting programs.

12 Next, the setup wizard installs the Scenarist BD suite of applications.

13 Once the installation is complete, the Completed page appears.



14 Click Finish. The setup wizard closes.

15 Open the Sentinel Dongle Drivers directory.

16 Double-click the Sentinel Protection Installer icon.

17 Follow the on-screen instructions.

18 Open the Scenarist Designer PS Install directory.

19 Double-click the Setup.exe icon.

20 Follow the on-screen instructions.

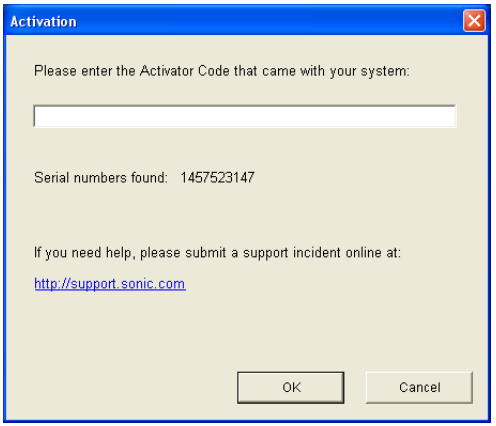
21 Open the Scenarist QC Install directory.

22 Double-click the Setup.exe icon.

23 Follow the on-screen instructions.

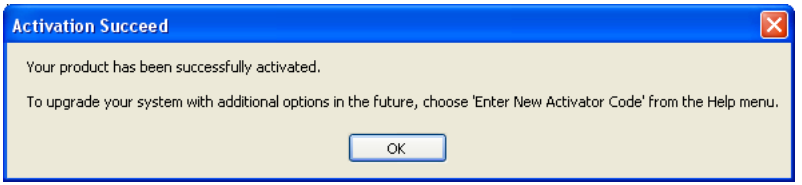
24 Attach the Scenarist BD dongle to your computer's USB port.

25 From the Windows Start menu, choose All Programs > Sonic > Scenarist BD > Scenarist BD. The Activation dialog box appears.



26 Enter the Activator Code for Scenarist BD. The Activator Code is case sensitive, and must be entered as such.

27 Click OK. The Activation Succeed dialog box appears.



28 Click OK. Scenarist BD opens.

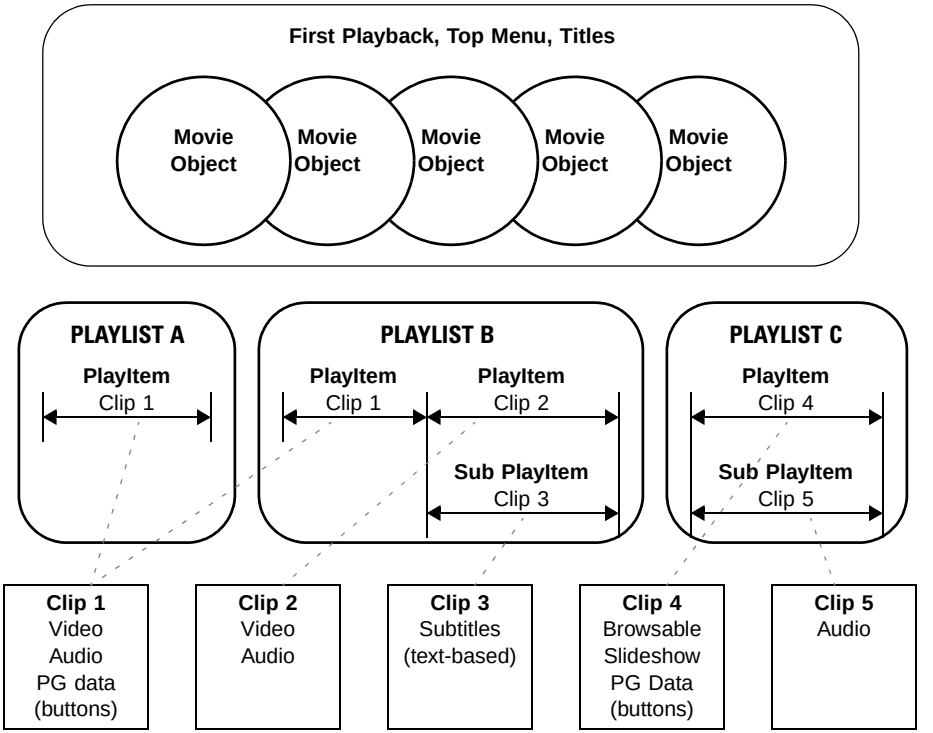
2 Using Scenarist BD

This chapter introduces you to Scenarist BD, the primary authoring application in the Scenarist BD suite of applications. It includes the following topics:

- "BD data structure" on page 24
- "Workflow for creating BD projects" on page 25
- "Scenarist BD" on page 27
- "HDMV image planes" on page 30
- "Menus in HDMV" on page 32

BD data structure

There is a very specific data hierarchy for BD projects:



Data hierarchy for BD projects

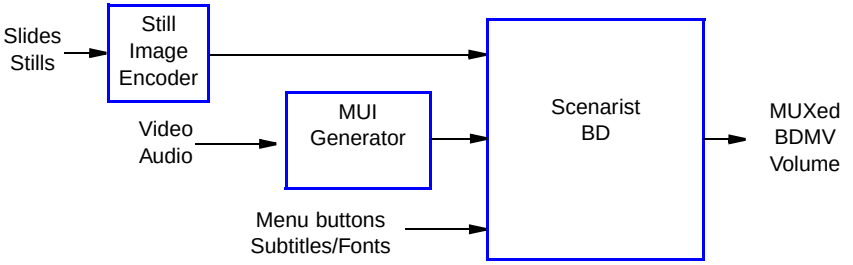
The basic building blocks for BD projects are **Clips**. Clips are defined by referencing video and audio assets, either the entire length of the asset or just a portion of it. Clips can be an entire movie complete with video, audio, subtitles, and buttons, or they can be a snippet of video for an intro, or a slideshow, or components that are MUXed outside the main presentation, such as audio for browsable slideshows or text-based subtitles.

Playlists are constructed from one or more Clips. Each item in a PlayList that contains a Clip is called a PlayItem. A PlayList can be a single PlayItem referencing a single Clip, or it can be multiple PlayItems played in succession, or even randomly.

The top-level items in a BD project are **Titles**. Titles determine how PlayLists are presented to the viewer. Each title contains a movie object, which holds navigation commands that point to PlayLists and PlayItems.

Workflow for creating BD projects

Creating a BD project with Scenarist BD involves preparing and importing assets; assembling Clips, PlayLists, and titles; and multiplexing and outputting the final project.



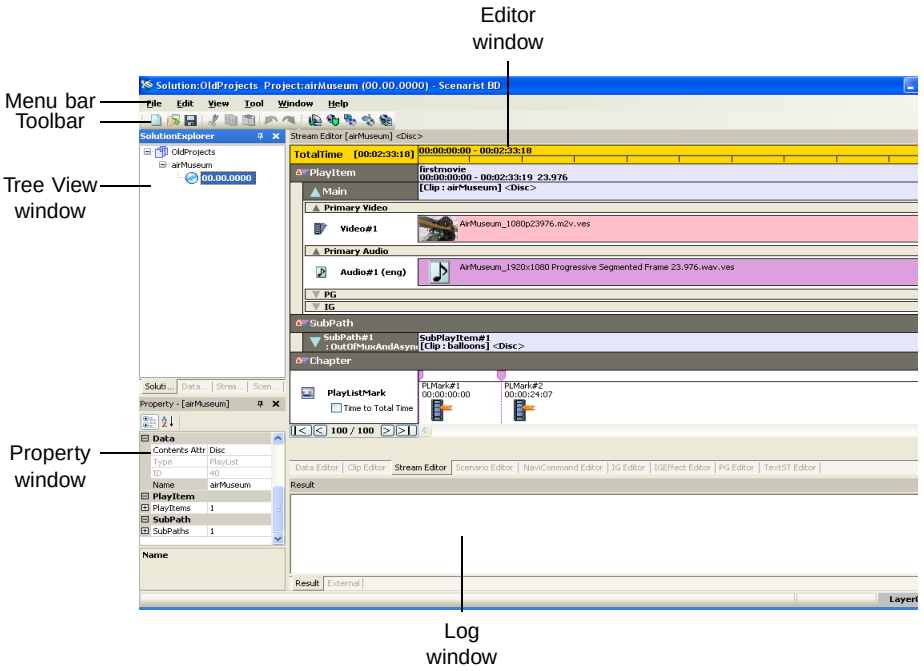
Workflow for creating BD projects with Scenarist BD

Authoring a BD title with Scenarist BD includes the following basic steps:

1. Prepare and encode any assets required for the project, including video, audio, still images, menu buttons, and subtitles.
2. Use the Still Image Encoder to encode still images for slideshows and menu backgrounds.
3. Use the MUI Generator to process video streams and audio streams.
4. In Scenarist BD, do the following:
   - Import assets by dragging them from Windows Explorer into the Data Tree in Scenarist BD. Organize the assets with asset folders as desired.
   - Create Clips, then add video and audio assets by dragging them from the Data Tree into the Clip Editor. Add subtitles to the Clips with Presentation Graphics. Add menu buttons to the Clips with Interactive Graphics.
   - Assemble the Clips into PlayLists in the Stream Editor. Insert PlayListMarks in the PlayLists that will serve as chapter points and link destinations.
   - Use the Scenario Editor to add titles to the project. Define title content by dragging PlayLists from the Stream Tree onto movie objects in the Scenario Editor.
   - Add navigation commands to movie objects to set playback order; add navigation commands to button objects to define link destinations.
5. Multiplex the project.
6. Output the project to a BDMV Volume.

Scenarist BD

Scenarist BD includes four main windows and a toolbar, each of which is described briefly below.



Scenarist BD

Tree View window •Contains four tabs that allow you to view and edit objects in a Scenarist BD project. The items can be collapsed and expanded, and organized with folders. The tabs at the bottom of the window determine which items are displayed. In general, projects are constructed by dragging items from the Tree View window into the Editor window. The following tree views are supported:

- **Solution Explorer Tab:** Lists the currently loaded solution and all versions of the projects contained in the current solution. Only one project can be loaded and edited in Scenarist BD at a time.

- **Data Tree Tab:** Lists the assets in the current project.
- **Stream Tree Tab:** Lists the clips and playlists of the current project.
- **Scenario Tree Tab:** Lists all of the titles in the current project.

Editor window Contains a number of editing tabs for assembling and connecting the project's basic components, which include Clips, presentation graphics, interactive graphics, PlayItems, PlayLists, movie objects, and titles.

Property window Displays and configures properties for the selected items in the Tree View window or Editor window. Properties can be expanded and collapsed, and sorted alphabetically or by category.

Log window Displays status and error message for a wide range of program operations. The tabs at the bottom of the window determine which messages are displayed.

Toolbar Contains buttons for common program functions, such as opening and saving projects; cut, copy, and paste; undo and redo; disc layout, MUXing, Binding, CPS Edit, and CMF Creation. In addition, the right side of the toolbar displays buttons and options for the Edit window, specific to the current tab, when it is the frontmost window.

Working with windows in Scenarist BD

The windows in Scenarist BD can be configured to suit your particular needs. Windows can be closed, docked, undocked, resized, and repositioned.

Working with Scenarist BD windows:

- To change what is displayed in a window, click one of its tabs at the bottom of the window, or select the item you want to display from the View menu.
- To dock or undock a window, double-click its titlebar.
- To close a window, click its Close button in the upper right of the window.

- To automatically hide a window, click its Auto Hide button in the upper right of the window. When hidden, only the window's name is displayed at the edge of the Scenarist BD main window; pointing to a hidden window's name temporarily displays the window.
- To adjust the size of docked windows, drag the dividers between them.
- To change the position of a docked window, drag the window by its titlebar to a new location. As you drag the window it snaps to available new locations.
- To return the Scenarist BD windows to their default state, choose Window > Default Layout.

Working with menus and options in Scenarist BD

There are multiple ways to invoke many of the operations in Scenarist BD. The most common duplication is with the Menu bar and the shortcut menu. Throughout this manual, the shortcut menu option is given as the option of choice in the step-by-step instructions (to avoid duplication). For example, in the section on "Creating movie Clips" on page 141, the first step reads as follows:

1 In the Stream Tree, right-click the Clip folder to which you will add the movie Clip, and choose Edit > New > Clip > Movie Application from the shortcut menu. A new Clip is added to the folder.

This same task can be accomplished using the Menu bar, as follows:

1 In the Stream Tree, select the Clip folder to which you will add the movie clip, and choose Edit > New Clip Movie Application from the Menu bar.

Even though the shortcut menu option is the only one given in the instructions, the Menu bar option is also available, and gives the same results.

In addition, many operations are also available via toolbar buttons associated with certain of the Editor window tabs; these appear on the right side of the toolbar when a specific tab is selected.

HDMV image planes

The HDMV format allows for the following independent image planes:

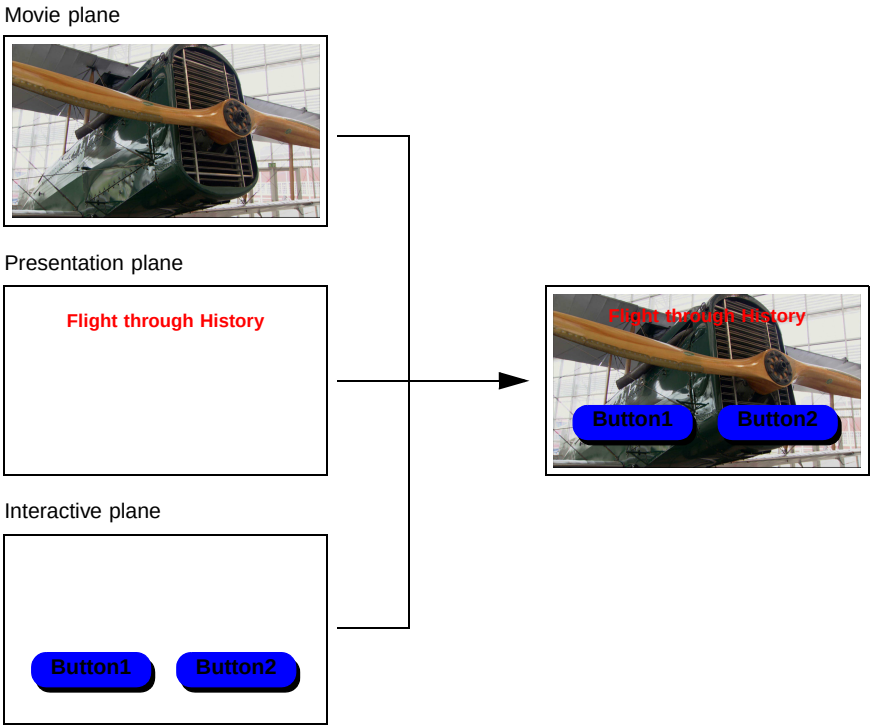


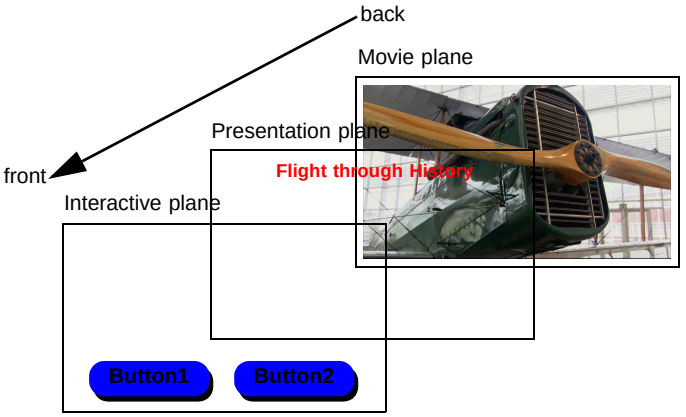
Image planes for HDMV titles

Movie plane Holds the main title material, comprised of high-definition video and surround audio. The movie plane is completely independent of the other image planes, allowing menu buttons to be navigated with no interruption in playback. It also holds still video images used for slideshows and certain menu backgrounds. On full-profile BD-ROM players, a Picture-in-Picture stream can be displayed on the movie plane.

Presentation plane Holds 8-bit non-interactive Presentation Graphics (PGs), which can be used as subtitles, titles, labels, or purely decorative graphics; for more information, see Chapter 12, "Presentation graphics." Instead of graphic-based (PG) subtitles, this plane can instead contain text-based subtitles that use OpenType fonts and user-defined text styles; for more information, see Chapter 14, "Text-based subtitles."

Interactive plane Holds 8-bit Interactive Graphics (IGs) and animations (IG effects). These Interactive Graphics can be buttons that are always on, such as those on the Top Menu, or they can be pop-up menu buttons called while the viewer is watching titles on the movie plane. For more information, see Chapter 10, "Interactive graphics," and Chapter 11, "Interactive graphic effects."

The three HDMV image planes are layered:



Layering of image planes in HDMV

Menus in HDMV

In HDMV, the basic elements of menus are Interactive Graphics (buttons) in the interactive plane. Since the three graphic planes in HDMV are separated and layered, video and audio can play uninterrupted in the movie plane while the user interacts with (IG) buttons in the interactive plane; in addition, the presentation plane can provide non-interactive graphic elements.

As a result, there are many menu options in HDMV:

Multi-page menus Since menus reside on the two graphics planes, completely separate from the video, menus are no longer separate entities; you can program them as sequences of graphics displayed one after the other, depending on how the user navigates between the different menus.

Pop-up menus Again, because of the separate graphic planes, you can create menus that appear or disappear — based on user requests — during video playback.

Always-on menus Always-on menus are effectively the equivalent of the menus found in DVD-Video. The user cannot hide these menus; they are usually displayed either on disc insertion or when the user selects a menu to be displayed. Just as with all the other menus in HDMV, you can program video to play in the background when an always-on menu is called, or you can use still video images in the background.

Hierarchical menus HDMV allows buttons to be shown or hidden at any point. This means that a user interface can be less cluttered, but still allow access to many options on a single page. These hierarchical menus will only show details when the user selects a particular option.

3 Preparing assets

This chapter documents preparing assets for Scenarist BD projects. It includes the following topics:

- "Asset requirements" on page 34
- "Using the Still Image Encoder" on page 35
- "Using the Audio Interleaver" on page 38
- "Using the MUI Generator" on page 45

Asset requirements

Scenarist BD supports the following formats for video and audio streams, still images, and fonts.

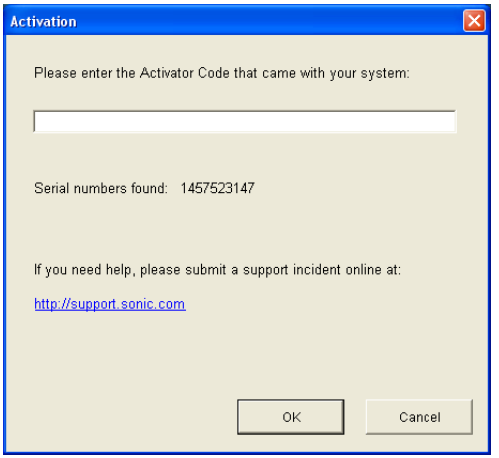
Table 1: *Asset requirements for Scenarist BD projects*

	Notes	File formats
Presentation graphics (subtitles)	Up to 256 colors (8 bits) supported. Images must be saved as indexed. Alpha channels are supported with PNG files.	PNG (.png) TIFF (.tif, .tiff)
Interactive graphics (buttons)	Up to 256 colors (8 bits) supported. Images must be saved as indexed. Alpha channels are supported with PNG files.	PNG (.png) TIFF (.tif, .tiff)
Still images (still menu backgrounds and slides)	Up to 32 bits supported. Images can be saved as RGB or indexed. Must be processed with the Still Image Encoder and then the MUI Generator before importing into Scenarist BD.	BMP (.bmp) JPEG (.jpg) TIFF (.tif, .tiff) PNG (.png)
Video streams	Elementary streams only. Must be processed with the MUI Generator before importing into Scenarist BD.	MPEG-2 (.m2v, mp2s, .mpg) AVC (.avc, .bsf, .264) VC-1 (.wmv)
Audio streams	Elementary streams only. Must be processed with the MUI Generator before importing into Scenarist BD.	AC-3 (.ac3) DTS (.dts, .cpt) LPCM (.lpcm, .pcm, .wav)
Button sounds	16 bits, 48 MHz, stereo or mono, no greater than 2 megs. Can be imported directly into Scenarist BD for use with IG buttons.	LPCM (.lpcm, .pcm, .wav)
Fonts	OpenType fonts can be imported directly into Scenarist BD and used for text-based subtitles.	OTF (.otf)

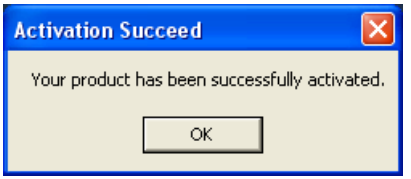
Using the Still Image Encoder

Any still images that will be used for slideshows or menu backgrounds in a Scenarist BD project must first be encoded with the Still Image Encoder. To encode a still image stream with the Still Image Encoder:

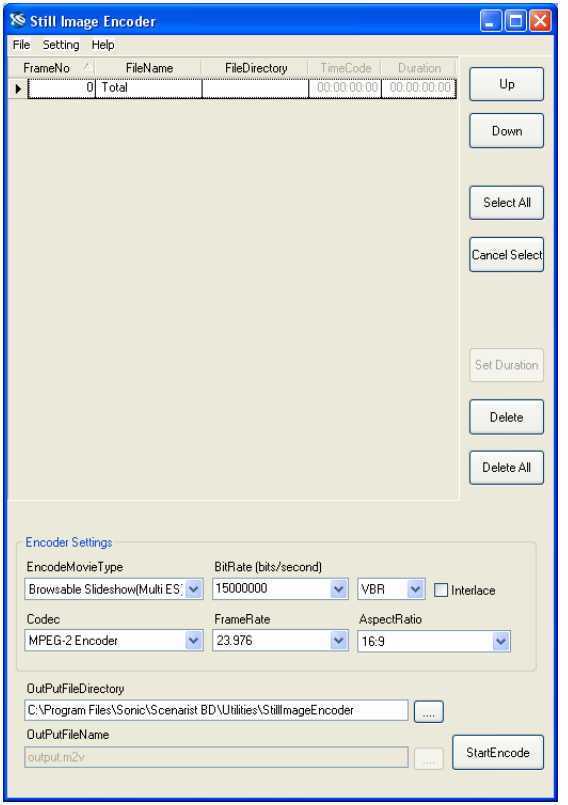
1. From the Windows Start menu, choose All Programs > Sonic > Scenarist BD > Utilities > Still Image Encoder.
2. The first time you launch the Still Image Encoder, the Activation dialog box appears.



3. Enter the Activator Code for the Still Image Encoder.
4. Click OK. The Activation Succeed dialog box appears.



5 Click OK. The Still Image Encoder window appears.



6 Set the Encode Movie Type to one of the following options:

Browsable Slideshow (Multi ES) A series of browsable images displayed in succession. Unlike Timebase Slideshows, these images can be set to infinite display in the BD project, so they can be navigated by the user. The Multi-ES format exports each image in the slideshow as an individual movie.

Browsable Slideshow (1 ES) A series of browsable images displayed in succession. Unlike Timebase Slideshows, these images can be set to infinite display in the BD project, so they can be navigated by the user. The 1 ES format exports all images in one slideshow movie.

Timebase Slideshow A series of images displayed in succession, each with a specified duration.

Movie A series of images displayed in succession, for a specified duration, which are written as a movie stream.

Movie (All I-Picture) A series of images displayed in succession, for a specified duration, which are written as a movie stream. All frames are I-frames, resulting in a larger file.

7 Do one of the following:

- To add a single image to the stream list, choose File > OpenFile. In the Open dialog box, select the image you want to add and click Open. The image is added to the stream list with a default duration of one second. Add additional images as necessary for slideshows.

  Note: You can also drag individual still images from Windows Explorer directly into the stream list in the Still Image Encoder window.

- To add multiple images to the stream list, choose File > OpenDir. In the Browse For Folder dialog box, select the folder containing the images you want to add and click OK. The images are added to the stream list in alphabetical order, based on their filenames, with a default duration of one second.

8 To set the duration for one or more images:

- In the stream list, click any images for which you will set the duration. To select all images, click Select All.
- Click Set Duration.
- In the Input Timecode dialog box, enter the duration in hours, minutes, seconds, and frames, then click OK. The location and durations for the images update.

9 To change the position of an image in the stream list, select the image and click Up or Down.

10 To delete an image from the stream list, select the image and click Delete.

11 Set the Codec for the still image stream; options are MPEG-2 Encoder, AVC Encoder, and VC-1 Encoder.

12 Set the Bit Rate, Frame Rate, and Aspect Ratio for the still image stream. If the stream will be interlaced, select the Interlace option.

13 Specify the output file path where the stream will be written. Click the Browse button at the bottom of the window, enter a filename and location for the stream, and click Save.

14 Click Start Encode. The images are encoded.

Using the Audio Interleaver

Source audio often consist of multiple mono files, one for each channel in the audio layout. Scenarist BD does not accept these multiple audio files, however; it requires a single, interleaved WAV or LPCM file.

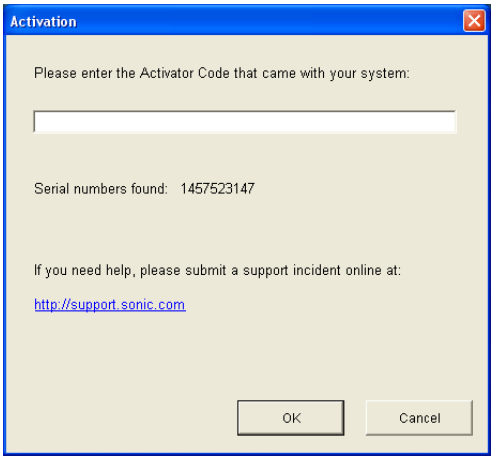
The Audio Interleaver answers this requirement. It accepts multiple mono source files, and converts them to a single interleaved WAV file, which can be imported for use in Scenarist BD.

Note: You can use the MUI Generator to perform this same function. For information, see “Interleaving multiple mono audio files” on page 51.

To use the Audio Interleaver:

1 From the Windows Start menu, choose All Programs > Sonic > Scenarist BD > Utilities > Audio Interleaver.

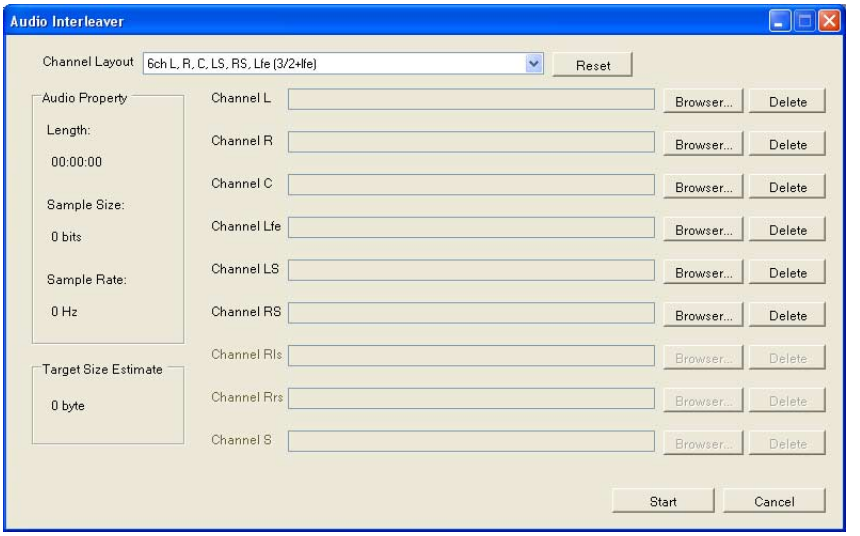
2 The first time you launch the Audio Interleaver, the Activation dialog box appears.



3 Enter the Activator Code for the Audio Interleaver.

4 Click OK. The Activation Succeed dialog box appears.

5 Click OK. The Audio Interleaver window appears.



6 Using the drop-down list, select the appropriate Channel layout. Options are:

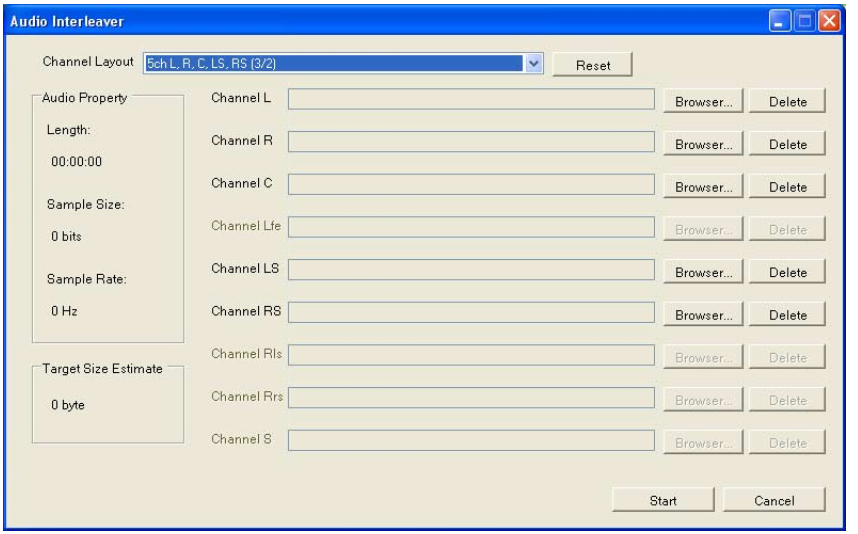
2ch stereo
3ch L, R, C (3/0)
3ch L, R, S (2/1)
4ch L, R, C, S (3/1)
4ch L, R, LS, RS (2/2)
5ch L, R, C, LS, RS (3/2)
6ch L, R, C, LS, RS, Lfe (3/2+lfe)
7ch L, R, C, LS, RS, Rls, Rrs (3/4)
8ch L, R, C, LS, RS, Rls, Rrs, lfe (3/4+lfe)

The abbreviations used in the drop-down list are as follows:

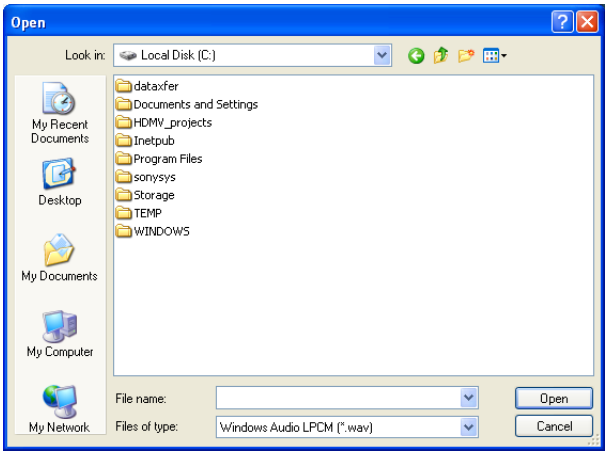
Channel	Description
L	Left
R	Right
C	Center

Channel	Description
LFE	Low Frequency Effects
LS	Left Surround
RS	Right Surround
Rls	Rear Left Surround
Rrs	Rear Right Surround
S	Surround

7 Once you have selected a Channel Layout, only the Browser buttons next to the channel fields used in that layout are active:

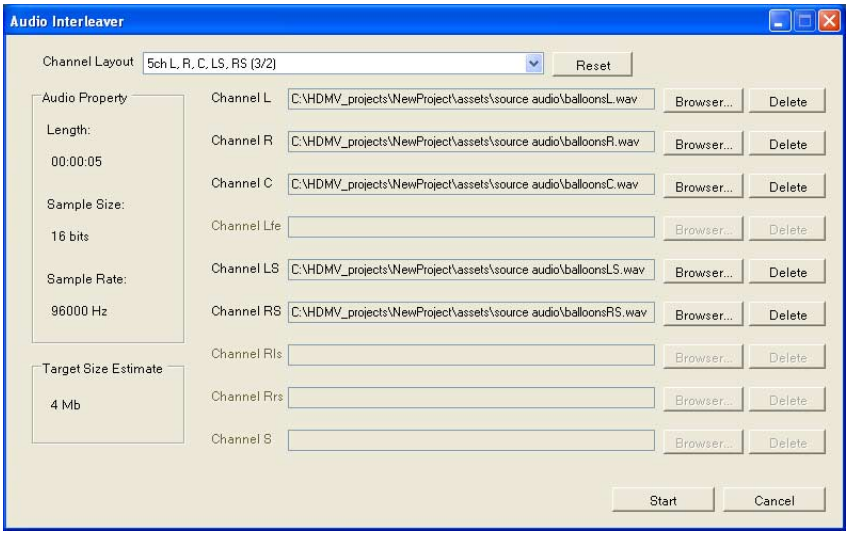


8 Click the Browse button next to the first active channel in your layout. The Open dialog box appears.

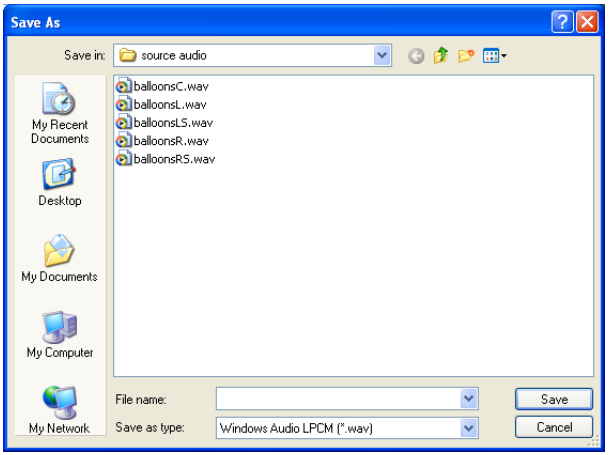


9 Locate and the select the mono audio source file for the channel; then click Open. The selected file (and complete filepath) appear in the channel field.

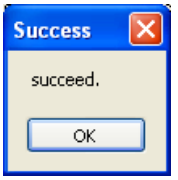
10 Using the method outlined in steps 8 and 9, above, selected mono source files for all of the active channels in your channel layout.



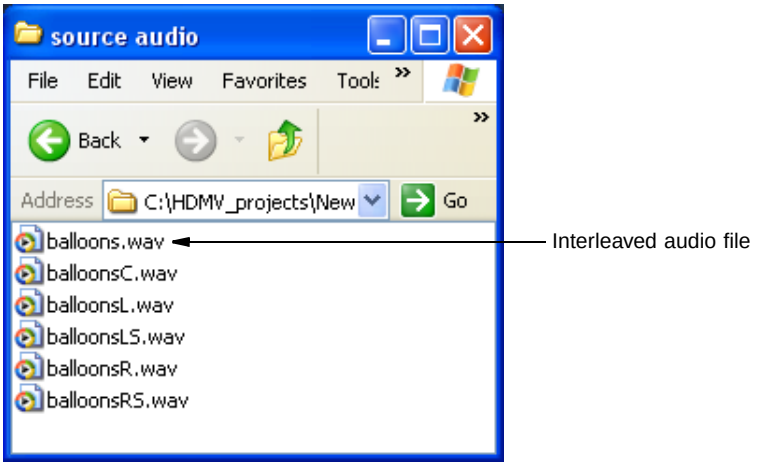
11 Click Start. The Save As dialog box appears.



12 Type in a name for your interleaved audio file, and select a destination location; then click Save. The audio interleaver creates the interleaved file. A Success dialog box appears.



13 Click OK. The interleaved audio file can be found at your specified destination location.



Using the MUI Generator

Elementary video and audio streams must be MUI processed for use with Scenarist BD. This can be accomplished with the MUI Generator, which generates data files required by Scenarist BD. Instead of importing the original video or audio stream, you will import one of these data files (the .ves file). Only elementary video and audio streams can be processed with the MUI Generator, and subsequently imported into Scenarist BD. Program streams are not supported.

This section includes the following topics:

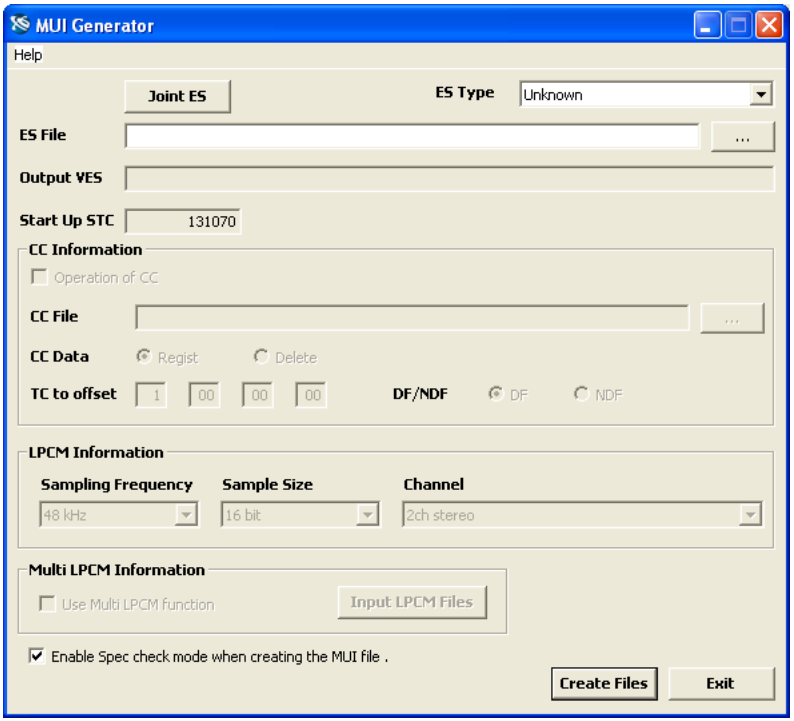
- "Preparing video streams" on page 46
- "Preparing audio streams" on page 47
- "Preparing multiple streams" on page 48

Note: Video and audio assets also can be MUI processed and imported directly into Scenarist BD, using a simple drag-and-drop process. For more information, see "MUI processing and importing with Scenarist BD" on page 79.

Preparing video streams

To prepare a video stream with the MUI Generator:

1 From the Windows Start menu, choose All Programs > Sonic > Scenarist BD > Utilities > MUI Generator. The MUI Generator window appears.



2 Do one of the following:

- Click the Browse button next to the ES File field and select the elementary video stream you want to prepare, then click Open. The path fields for ES File and Output VES update.
- Drag the video stream you want to prepare from Windows Explorer into the ES File field. The path fields for ES File and Output VES update.

Note: If the MUI Generator doesn't recognize the video stream's file type automatically, select the file type from the drop-down list associated with the unlabeled field to the right of the Browse button.

3 If the stream will contain closed captions, select the Operation of CC option, specify the CC file, and configure the remaining CC options.

4 Click Create Files. The MUI Generator writes the following files to the same directory as the source video stream:

<filename>.mui
<filename>.ves
<filename>.xui

Note: Make sure not to move or delete any of these data files, they must reside in the same folder as the video stream that generated them. When importing the video into Scenarist BD, import the .ves file.

5 Click Exit to close the MUI Generator program.

Preparing audio streams

To prepare an audio stream with the MUI Generator:

1 From the Windows Start menu, choose All Programs > Sonic > Scenarist BD > Utilities > MUI Generator. The MUI Generator window appears.

2 Do one of the following:

- Click the Browse button next to the ES File field and select the elementary audio stream you want to prepare, then click Open. The path fields for ES File and Output VES update.
- Drag the audio stream you want to prepare from Windows Explorer into the ES File field. The path fields for ES File and Output VES update.

Note: If the MUI Generator doesn't recognize the audio stream's file type automatically, select the file type from the drop-down list associated with the unlabeled field to the right of the Browse button.

3 Set the Sampling Frequency, Sample Size, and Channel configuration for the audio stream.

4 Click Create Files. The MUI Generator writes the following files to the same directory as the source audio stream:

<filename>.mui
<filename>.ves
<filename>.xui

Note: Make sure not to move or delete any of these data files, they must reside in the same folder as the audio stream that generated them. When importing the audio into Scenarist BD, import the .ves file.

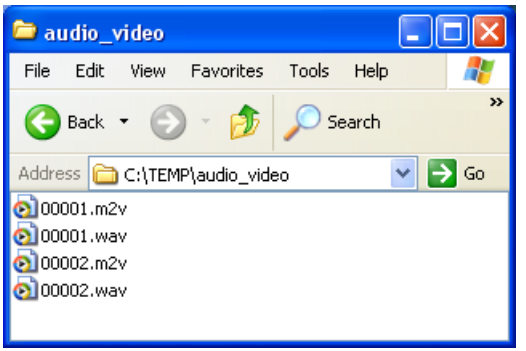
5 Click Exit to close the MUI Generator program.

Preparing multiple streams

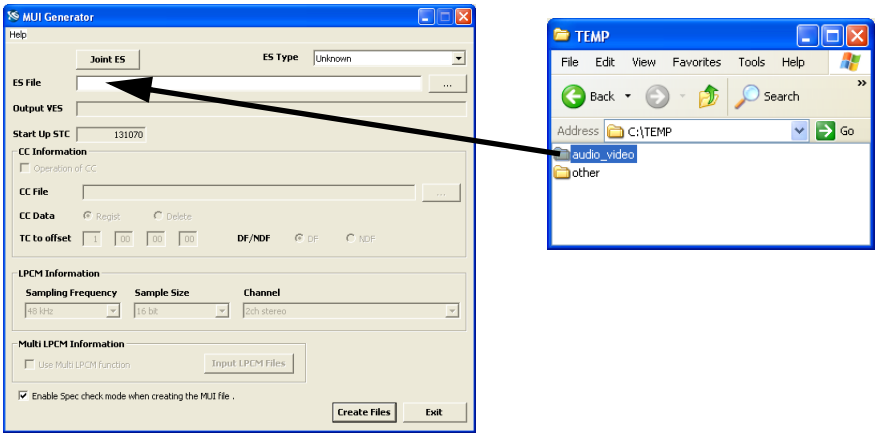
To prepare multiple streams with the MUI Generator:

1 From the Windows Start menu, choose All Programs > Sonic > Scenarist BD > Utilities > MUI Generator. The MUI Generator window appears.

2 Locate the folder that contains the multiple streams you want to prepare.

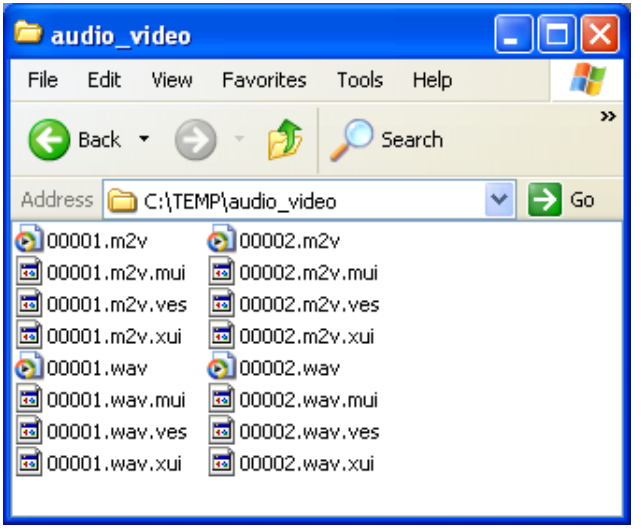


3 Drag the folder containing the streams you want to prepare into the ES File field of the MUI Generator.



The path for the ES File field updates.

4 Click Create Files. The MUI Generator writes the necessary files for each stream to the same folder as the source streams.



Note: The selected files must be file types that the MUI Generator recognizes; all unrecognized file types will be skipped.

5 A dialog box informs you when the process is complete.

6 Click OK; then click Exit to close the MUI Generator program.

Interleaving multiple mono audio files

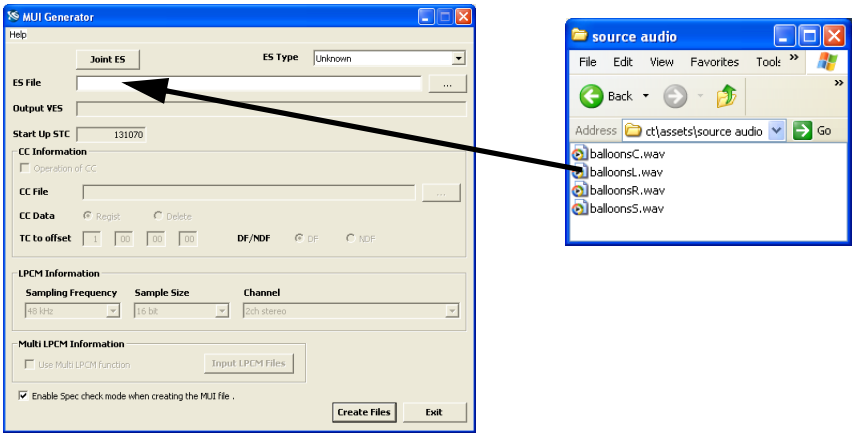
Source audio often consist of multiple mono files, one for each channel in the audio layout. Scenarist BD does not accept these multiple audio files, however; it requires a single, interleaved WAV or LPCM file.

The MUI Generator deals with this by accepting multiple mono source files and combining them into a single, interleaved audio file, which it then processes for use by Scenarist BD.

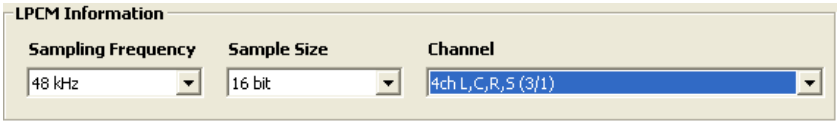
Note: You can use the Audio Interleaver utility to perform this same function. For information, see "Using the Audio Interleaver" on page 38.

To combine and process multiple mono audio files:

1 Drag one of the source mono files into the ES File field of the MUI Generator.

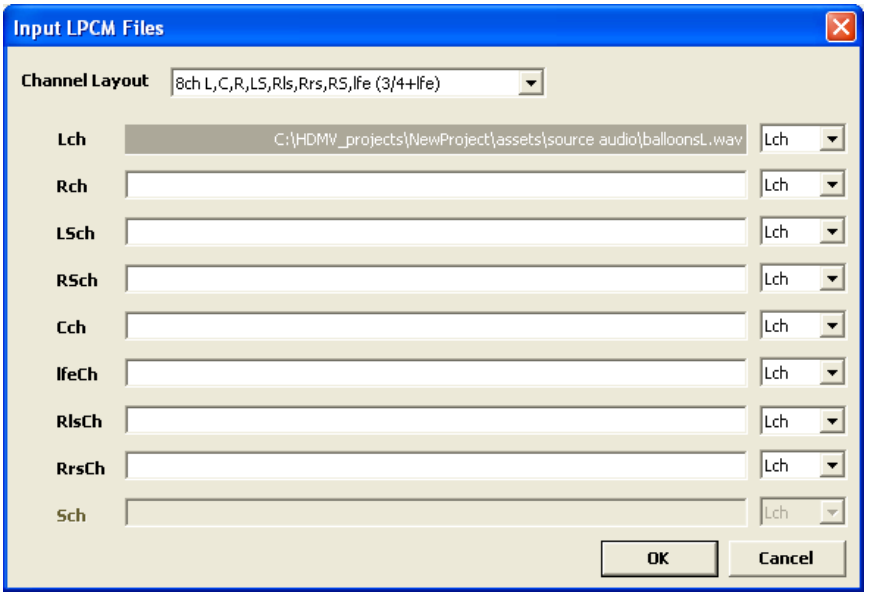


2 In the LPCM Information group box, select the appropriate channel configuration.



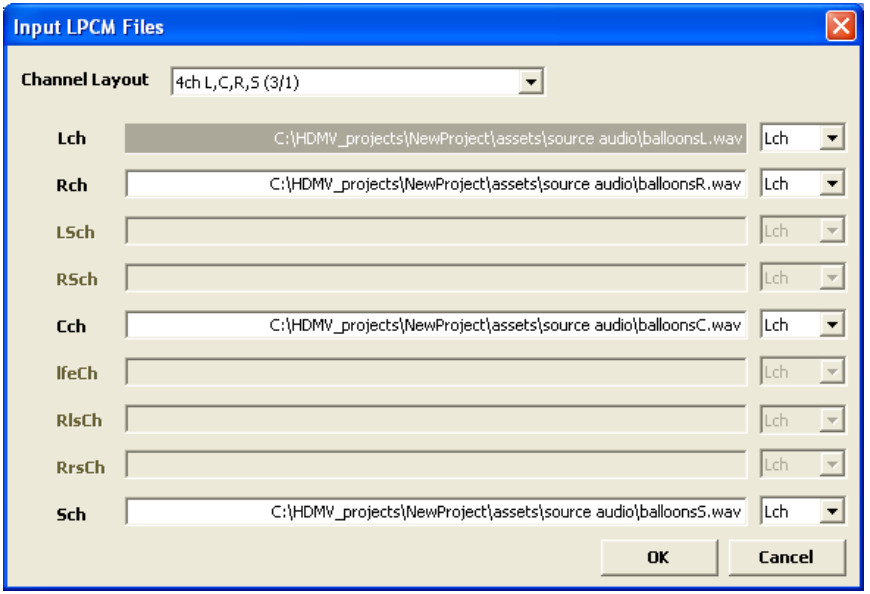
3 In the Multi LPCM Information group box, click the Use Multi LPCM function checkbox to activate the option.

4 Click Input LPCM Files. The Input LPCM Files dialog box opens.



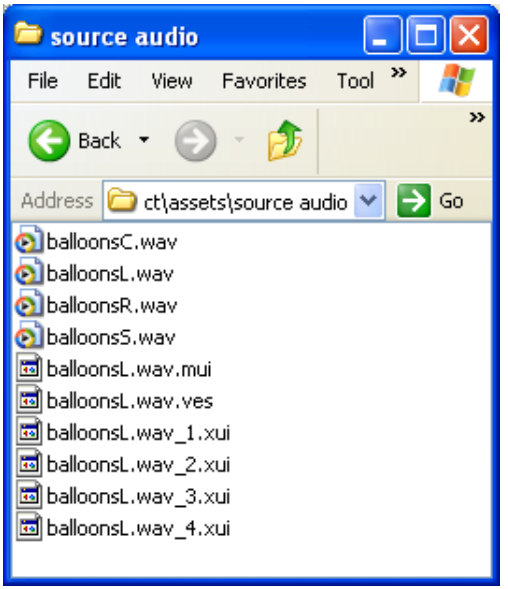
5 Using the drop-down list, select the appropriate Channel layout.

6 Drag the appropriate source mono file into each of the active channel fields.

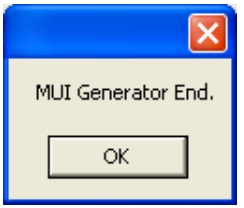


7 Click OK. The Input LPCM Files dialog box closes.

8 In the MUI Generator window, click Create Files. The MUI Generator interleaves and processes the files, the writes the files necessary for Scenarist BD to the same folder as the source audio files.



A dialog box informs you when the process is complete.



Note: All the MUI-processed files will have the same name as the mono file you dragged into the ES File field of the MUI Generator in step 1.

4 Creating Solutions and Projects

This chapter documents creating Solutions and Projects in Scenarist BD. It includes the following topics:

- "Project management" on page 56
- "Creating Solutions" on page 57
- "Creating Disc Projects and Projects" on page 60
- "Importing Projects" on page 65
- "Using the DB Converter" on page 70

Project management

Scenarist BD now has a hierarchical approach to project management, which gives you much more flexibility and control over your BD projects:

- The highest level in the hierarchy is the **Solution**; this is a receptacle that can house multiple titles and projects.
- The second level is the **Disc Project**, which represents a disc title.
- The next level is the **Project**, which corresponds to a specific version of a disc title. Only one Project can be loaded and edited in Scenarist BD at a time.

You can create multiple Disc Projects within a single Solution, and can create multiple Projects within a single Disc Project. Since Scenarist BD assigns a version number to each Project within a Disc Project, it is easy to keep track of the various iterations of your disc title.

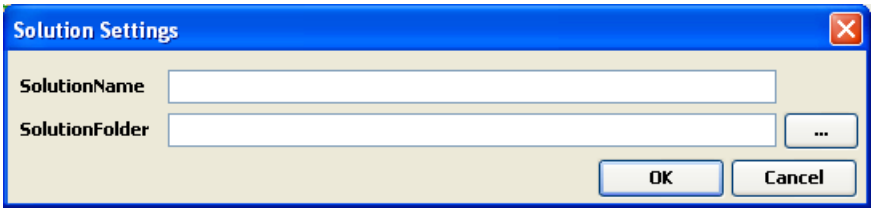
In addition, projects can contain multiple sub-projects, and you can designate specific sub-project content as being Disc content or Net content (VFS updates).

Creating Solutions

A Solution is the highest level in the project management hierarchy. It is a receptable that can house multiple Disc Projects (disc titles) and projects (versions of titles).

To create a Solution:

1. In Scenarist BD, choose File > New Solution. The Solution Settings dialog box appears.

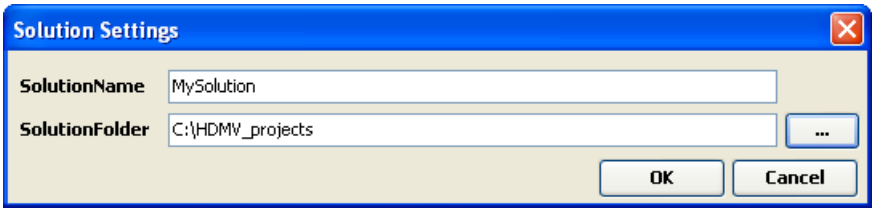


2. Enter a name for your Scenarist BD Solution in the Solution Name field, using only alphanumeric characters. This will be used as the default filename for the Solution (.ssol) file.

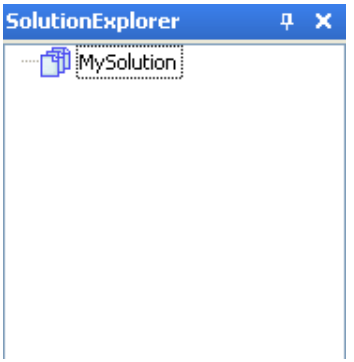
3 Click the Browse button to the right of the Solution Folder field. The Browse for Folder dialog box appears.

4 Locate the HDMV_projects folder on your C drive

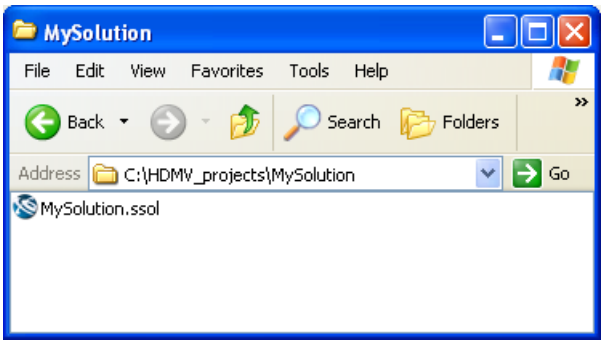
5 Click OK. The path appears in the Solution Folder field of the Solution Settings dialog box.



6 Click OK. Scenarist BD creates the Solution, which appears in the Solution Explorer.



The Solution (.ssol) file resides in a newly created folder within the HDMV_projects folder.

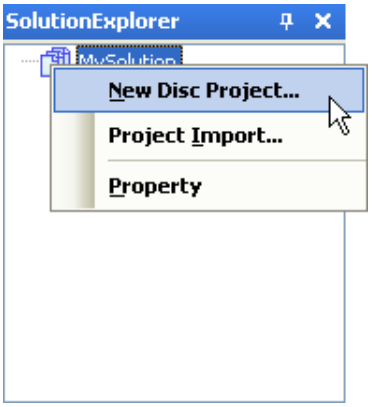


Creating Disc Projects and Projects

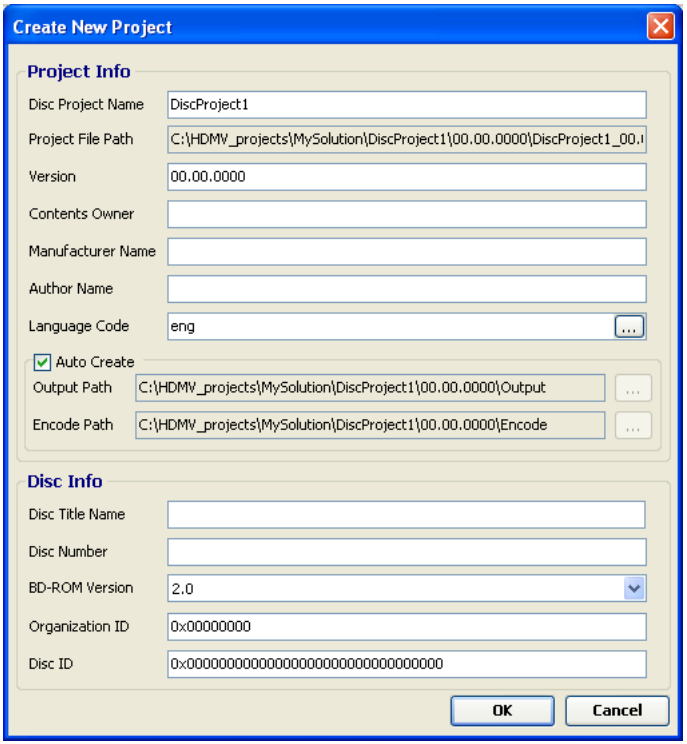
Disc Projects are the second level in the project management hierarchy. Each Disc Project represents a disc title. When you create a Disc Project, Scenarist BD automatically creates a first project version within that Disc Project.

To create a Disc Project:

1 In the Solution Explorer, right-click on the Solution; then select New Disc Project from the shortcut menu.



The Create New Project dialog box appears



2 Enter a name for the Scenarist BD Disc Project in the Disc Project Name field, using only alphanumeric characters. This name will be used as the default filename for the project (.sbdprj) file.

3 Enter or select optional data into the following fields:

- Contents Owner
- Manufacturer Name
- Author Name
- Disc Title Name
- Disc Number

- BD-ROM Version
- Organization ID
- Disc ID

Note: Much of the information entered in the Create New Project dialog box can be changed later in the Settings window (available via the Tool menu). For more information, see Chapter 7, "The Settings window," on page 105.

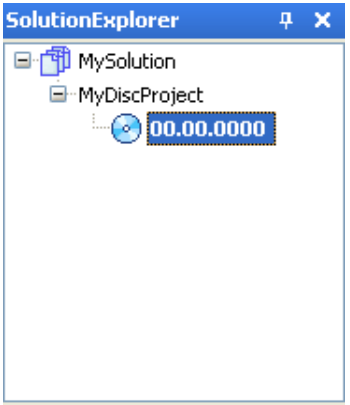
4 Select a Language Code for the project.

Note: This sets the default Language Code for all assets, real and virtual, that are imported or created for the project.

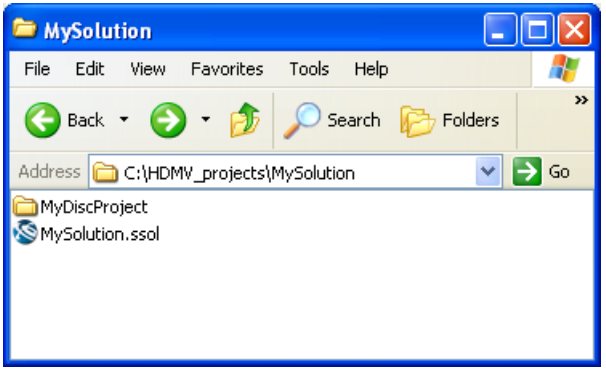
The default setting for this field is the language of your computer's OS. To select a different Language Code, click the Browse button next to the Language Code field; in the Language Code dialog box, select the language you want to use for the asset; then click OK.

Note: If you know the appropriate three-letter Language Code (for example, "eng" for English), you can type it in manually, instead of using the Browse button and the Language Code dialog box to select a Language Code.

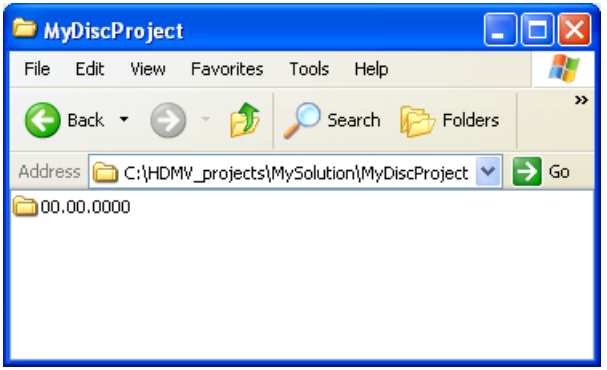
5 Click OK. Click OK. Scenarist BD creates the Disc Project and the first Project version, both of which appear in the Solution Explorer.



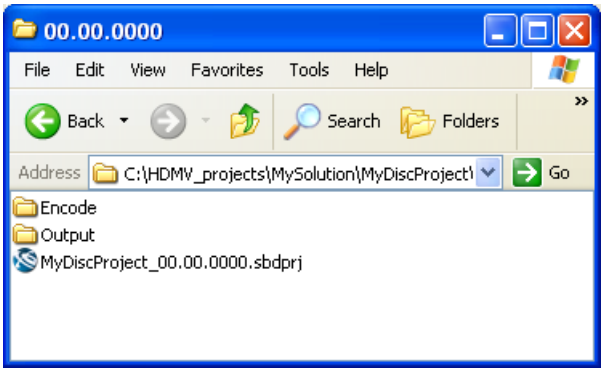
The Disc Project exists as a newly created folder within the Solution folder.



Within the Disc Project folder is a folder that houses the first Project, which is given a (xx.xx.xxxx) version number.



Within the Project (version) folder is the Project (.sbdprj) file and its associated Output and Encode folders. The Project filename includes both the Disc Project name and the version number for the Project.

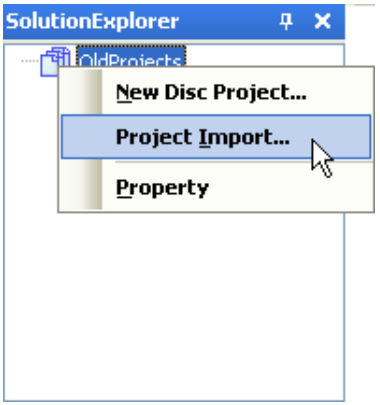


Importing Projects

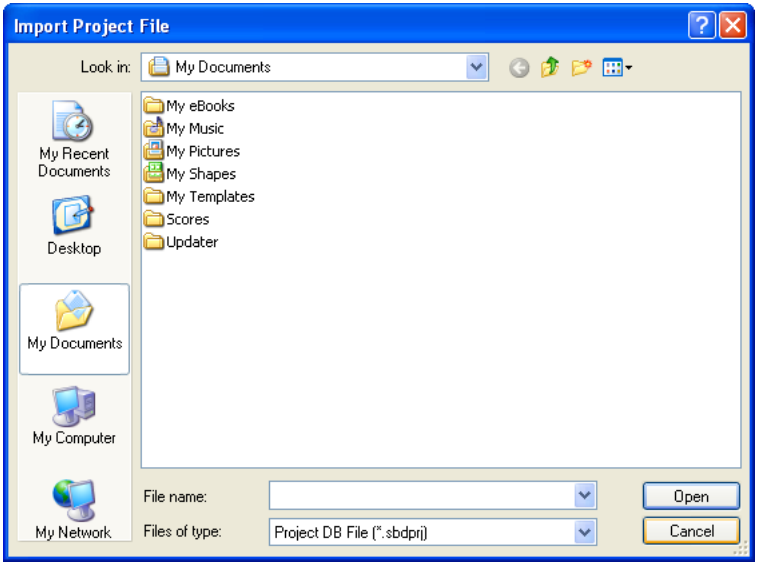
In order to work with projects created using Scenarist BD version 4.5.1 or later, you need to import them into a Solution.

To import a (4.5.1 or later) Project:

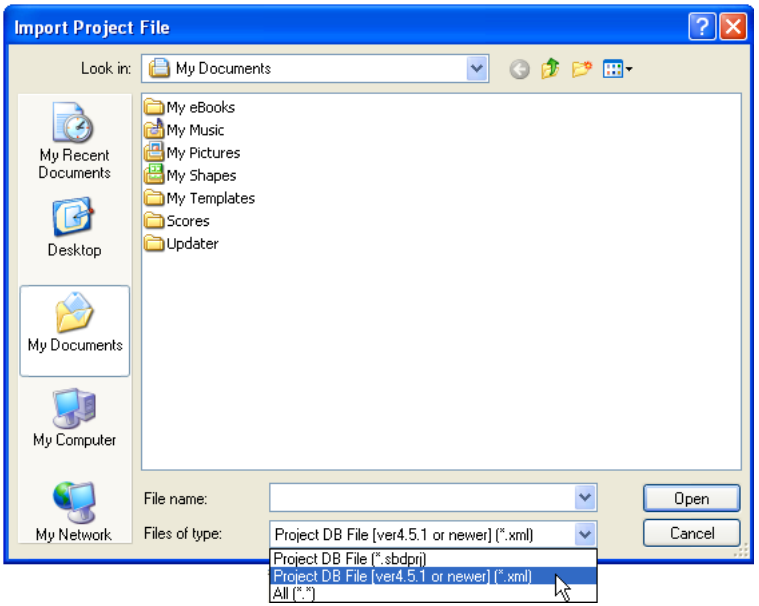
1. Create a Solution, using the steps outlined in “Creating Solutions” on page 57.
2. In the Solution Explorer, right-click on the Solution; then select Project Import from the shortcut menu.



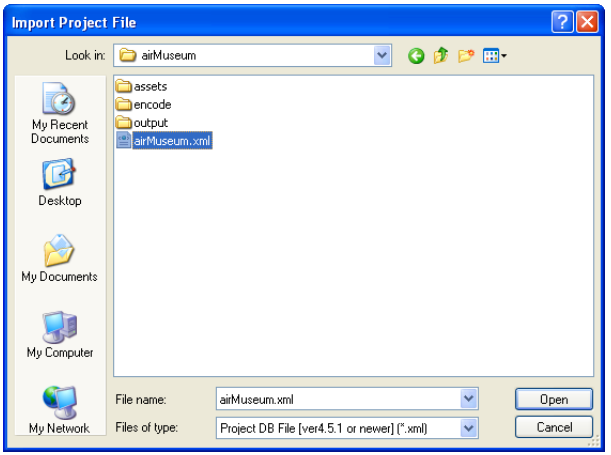
The Import Project File dialog box appears.



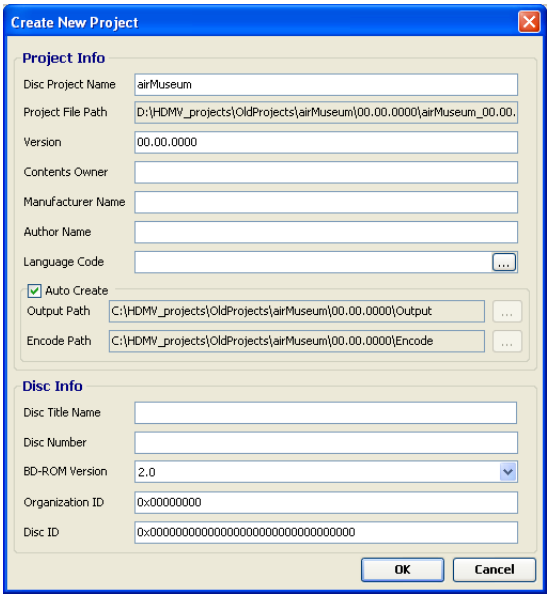
3 In the Type of File field, select “Project DB File (4.5.1 or newer) (*.xml)” using the drop-down menu.



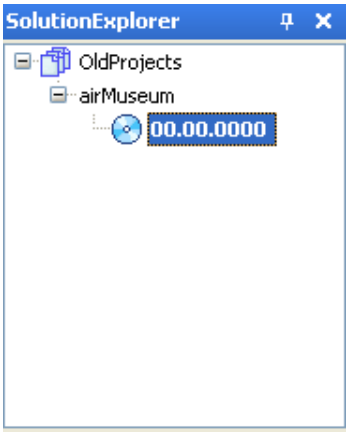
4 Locate the Project you want to import.



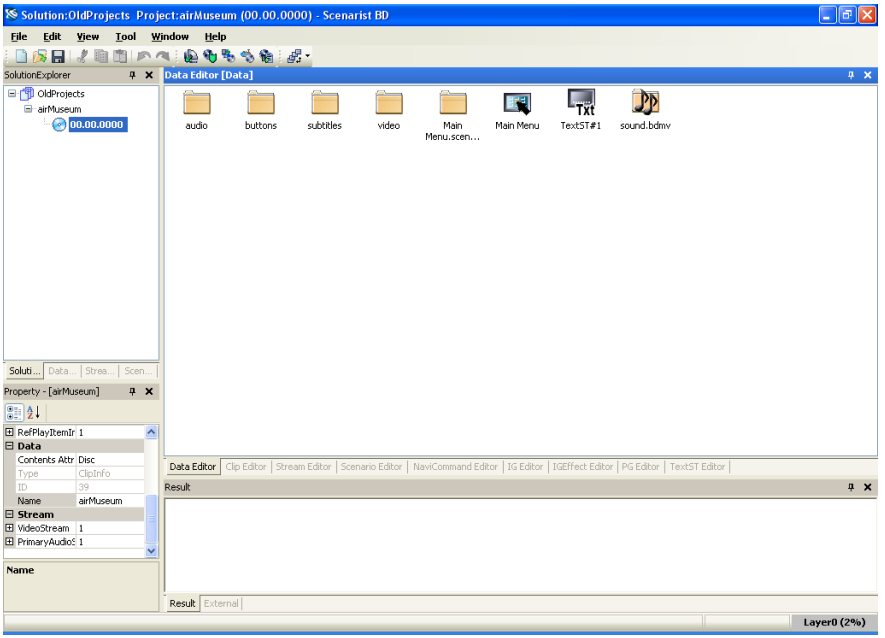
5 Click Open. The Project is imported into Scenarist BD, and appears in the Solution Explorer.



6 Enter data in the fields as appropriate; then click Open. The Project is imported into SScenarist BD, and appears in the Solution Explorer.



All of the assets, clips, PlayLists, and titles that are part of the Project are loaded into Scenarist BD, and are available for editing.

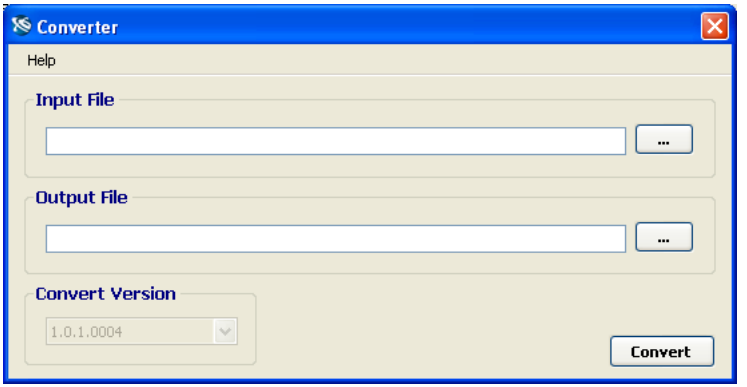


Using the DB Converter

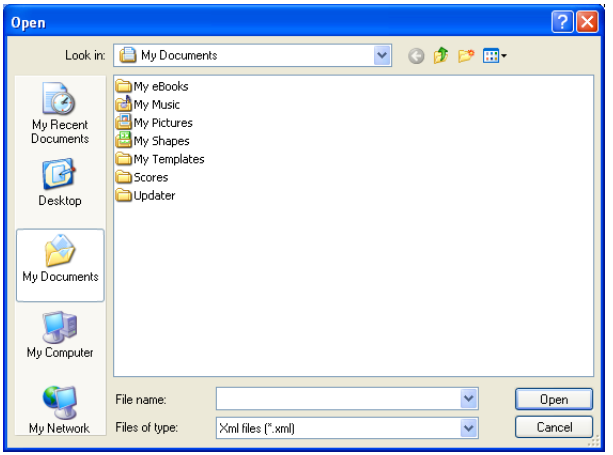
In order to work with a Project created using a version of Scenarist BD prior to 4.5.1, you must first converter the database file of that project using the DB Converter.

To Import a (prior to version 4.5.1) Project:

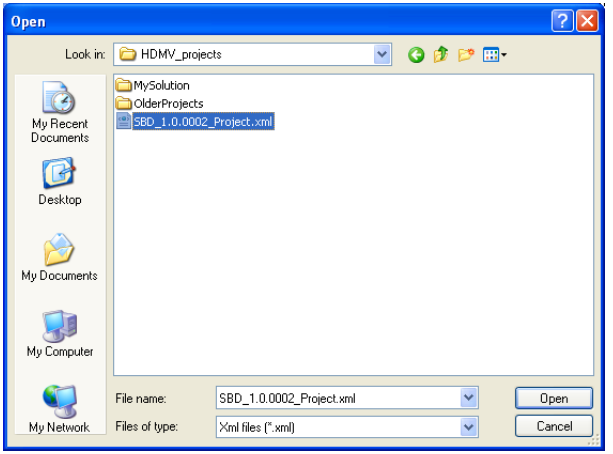
1. Create a Solution, using the steps outlined in “Creating Solutions” on page 57.
2. From the Windows Start menu, choose All Programs > Sonic > Scenarist BD > Utilities > DB Converter. The DB Converter opens.



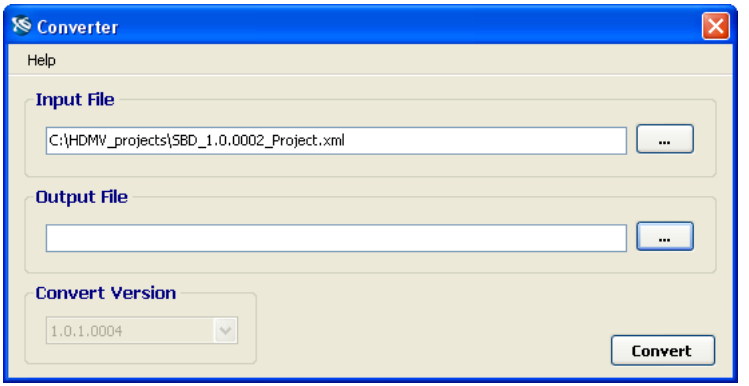
3 Click the Browse button to the right of the Input File field. The Open dialog box appears.



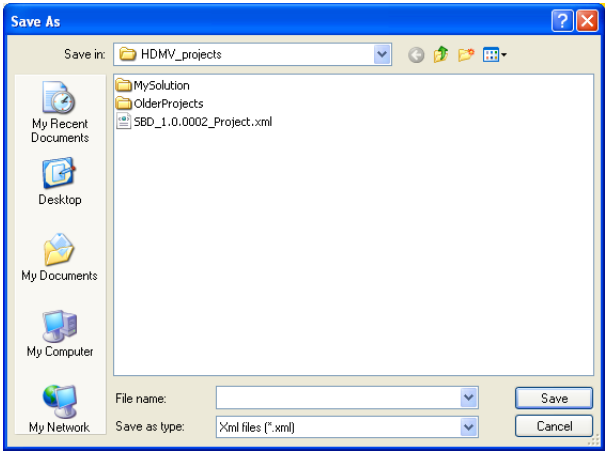
4 Locate your Project (.xml) file.



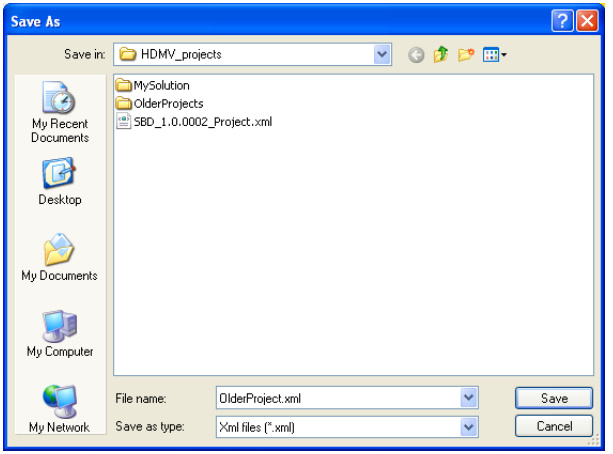
5 Click Open. The path to the Project file appears in the Input File Field.



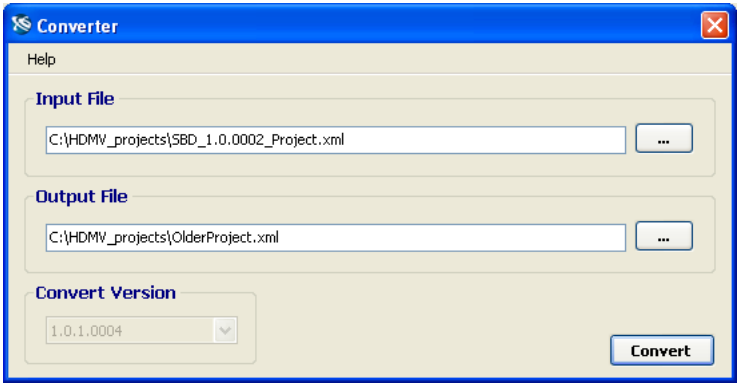
6 Click the Browse button to the right of the Output File field. The Save As dialog box appears.



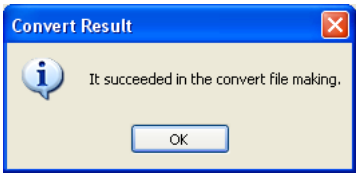
7 Select an appropriate location for your converted file. Then give the file an appropriate name (with a .xml) suffix).



8 Click Save. The path to the new file appears in the Output File field.



9 Click Convert. The DB Converter converts the old Project file. A Convert Result dialog box appears.



10 You can now import this converted Project file into your Solution, using the steps outlined in “Importing Projects” on page 65

5 Importing assets to a project

This chapter documents importing assets to a Scenarist BD project. It includes the following topics:

- "Creating asset folders" on page 76
- "Importing assets" on page 77
- "MUI processing and importing with Scenarist BD" on page 79
- "Regenerating MUI files for older projects" on page 86

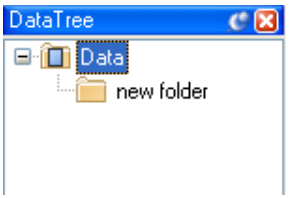
Note: Before still image assets can be imported into a Scenarist BD project, they must be prepared using the Still Image Encoder (for more information, see "Using the Still Image Encoder" on page 35). Video and audio assets can be prepared using the MUI Generator (see "Using the MUI Generator" on page 45); they can also be MUI processed directly within Scenarist BD, using the drag-and-drop process described in "MUI processing and importing with Scenarist BD" on page 79.

Creating asset folders

Because projects can contain many assets, as well as a variety of different types of assets, it is usually a good idea to organize them with asset folders. Asset folders can be organized based on asset type (video, audio, menus, slides, buttons, subtitles, etc.), or they can be based on the PlayLists and movie objects that will reference the assets (First Playback, Top Menu, Movie Title, Slideshow Title, etc.).

To create an asset folder:

1. Click the Data Tree tab in the Tree window.
2. In the Data Tree, right-click the folder to which you will add the new asset folder. {If this is the first asset folder added to the project, right-click the Data folder) Then choose New > Folder from the shortcut menu. A new asset folder is added to the project.



3. To rename the new asset folder, click its name twice so it becomes selected, enter the new name, and press Enter.

Importing assets

Assets can be registered with the New command, or they can be dragged from Windows Explorer into asset folders in Scenarist BD. Importing by dragging from Windows Explorer has the advantage of being able to import multiple assets by dragging folders containing assets.

Note: When importing video and audio streams, make sure to import the .ves file previously written by the MUI Generator. For more information, see "Using the MUI Generator" on page 45.

To import assets to a Scenarist BD project:

1 Do one of the following:

- In the Data Tree, right-click the folder to which you will add the asset, and choose Edit > New > Actual Asset from the shortcut menu. In the Open dialog box, select the asset you want to import and click Open.
- Drag an asset file or folder from Windows Explorer into a folder in the Data Tree in Scenarist BD.

  Note: To include an asset in the main Data folder, just drag it anywhere inside the Data Tree window; Scenarist BD automatically registers it in the (root) Data folder.

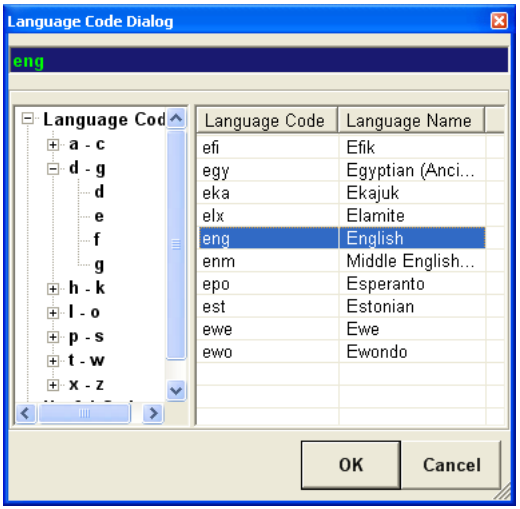
2 Monitor the Result window to see that the assets are imported successfully. Once imported, the assets appear in the Data Tree.

Changing the Language Code for assets

In some circumstances, you may need to change the Language Code for specific audio and virtual assets in your project. The Language Code determines under which circumstances the streams will be available for playback.

To set the Language Code for assets:

1. In the Data Tree, select the asset for which you will set the Language Code. To set the Language Code for multiple assets, Shift-click each asset you want to configure.
2. In the Properties window, click the Browse button next to the Language Code field.
3. In the Language Code dialog box, select the language you want to use for the asset, then click OK.



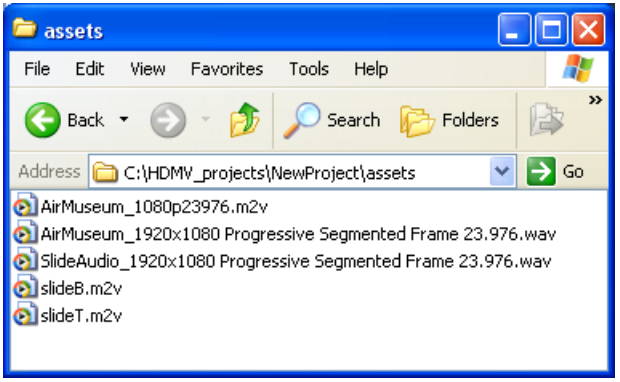
Note: If you know the appropriate three-letter Language Code (for example, “eng” for English), you can type it in manually, instead of using the Browse button and the Language Code dialog box to select a Language Code.

MUI processing and importing with Scenarist BD

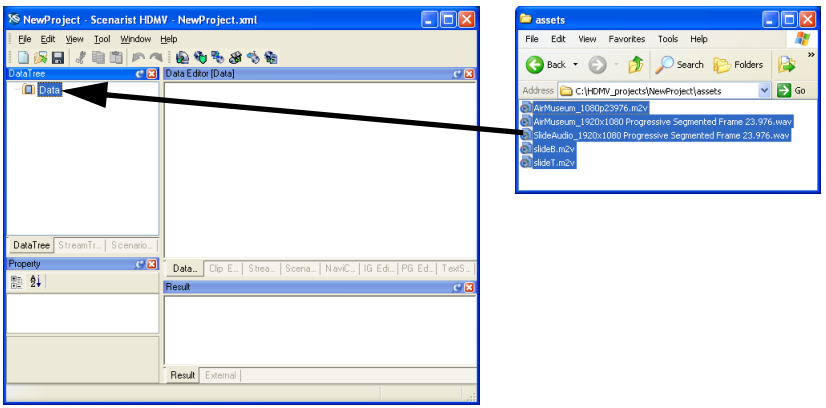
Scenarist BD gives you the option of MUI processing and importing elementary video and audio streams directly, in batches, using a simple drag-and-drop procedure.

To process and import video and audio streams:

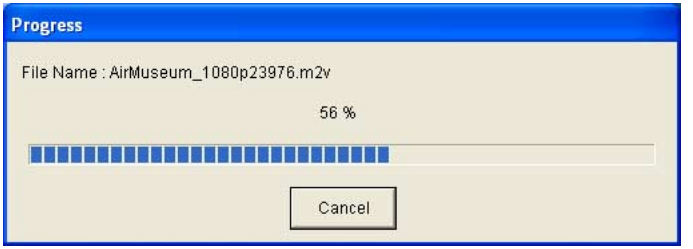
1 Locate the folder containing the video and audio assets you want to import.



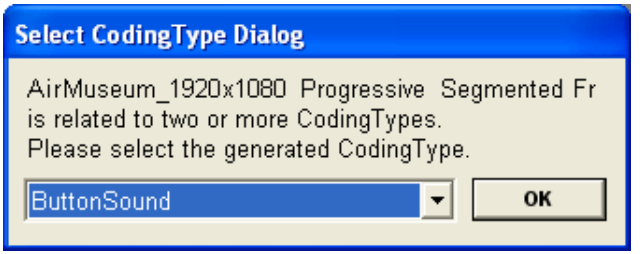
2 Select the assets you want to import. Drag and drop them into the Data Tree in Scenarist BD.



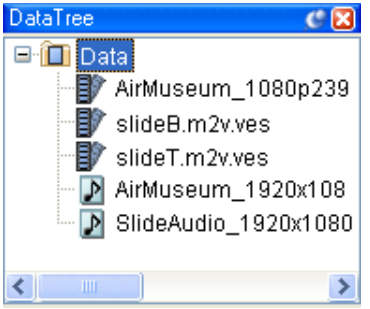
3 Scenarist BD begins to process the assets. A status bar shows the progress of each asset's processing.



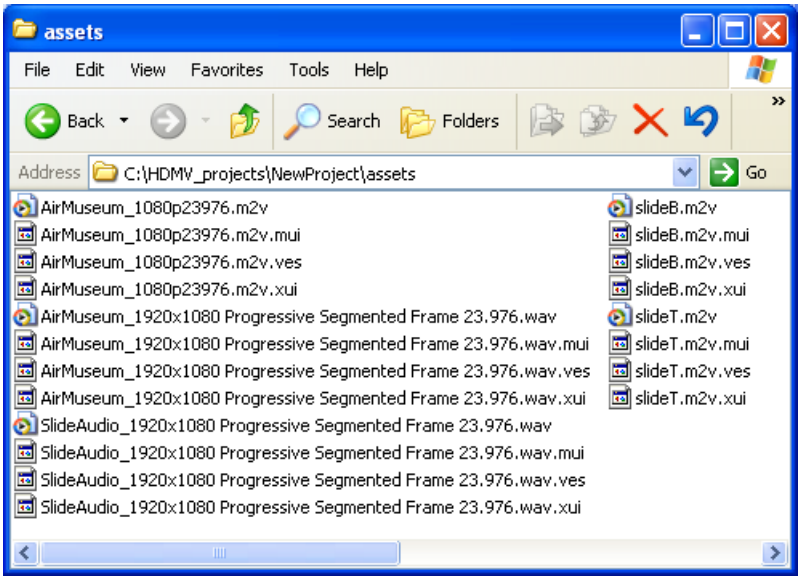
4 Sometimes an asset can be used in more than one way within Scenarist BD. Before processing such an asset, the program asks you to select the correct coding type for the asset.



5 For each such asset, select the proper coding type, then click OK. Once the processing is complete, the assets appear in the Data Tree.



6 The MUI processed files appear in the same folder that houses the elementary video and audio assets.



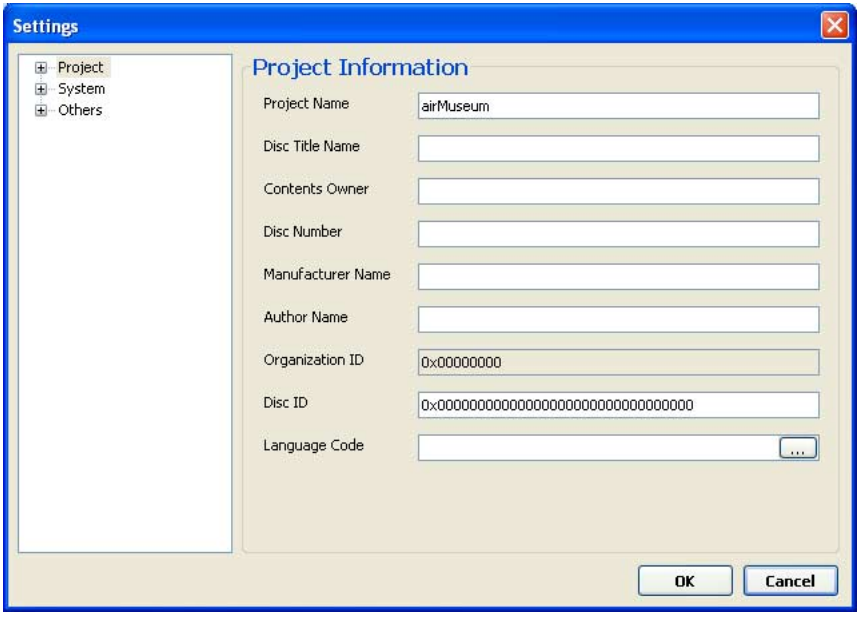
Note: The selected asset files must be file types that Scenarist BD recognizes; all unrecognized file types will be skipped, and won't be imported. To add to the list of file extensions recognized by the program, see "Modifying the asset processing/import function" on page 82, below.

Modifying the asset processing/import function

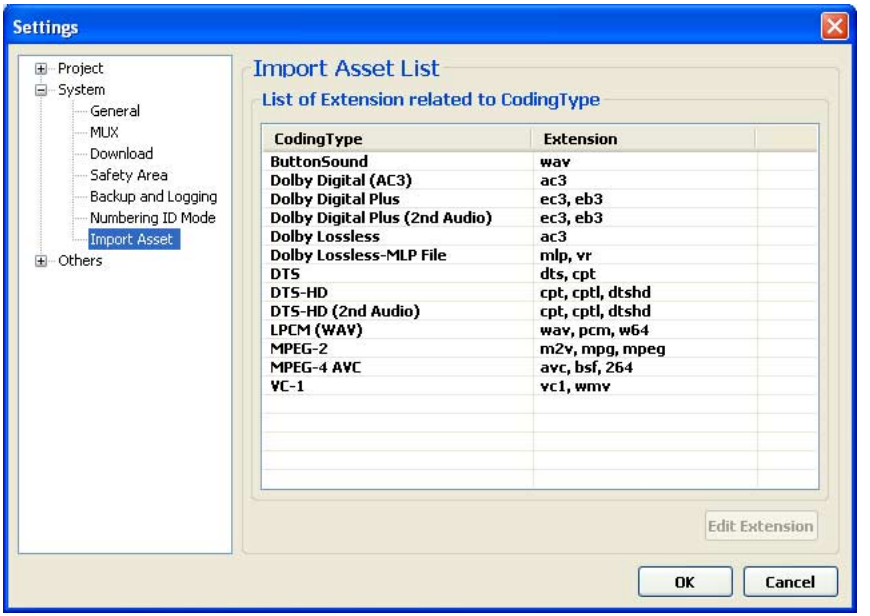
Scenarist BD gives you the ability to add to the list of file types recognized by the program, or to associate specific file extensions to specific coding types.

To modify the asset processing/import function:

1 Choose Tool > Settings. The Settings window appears.

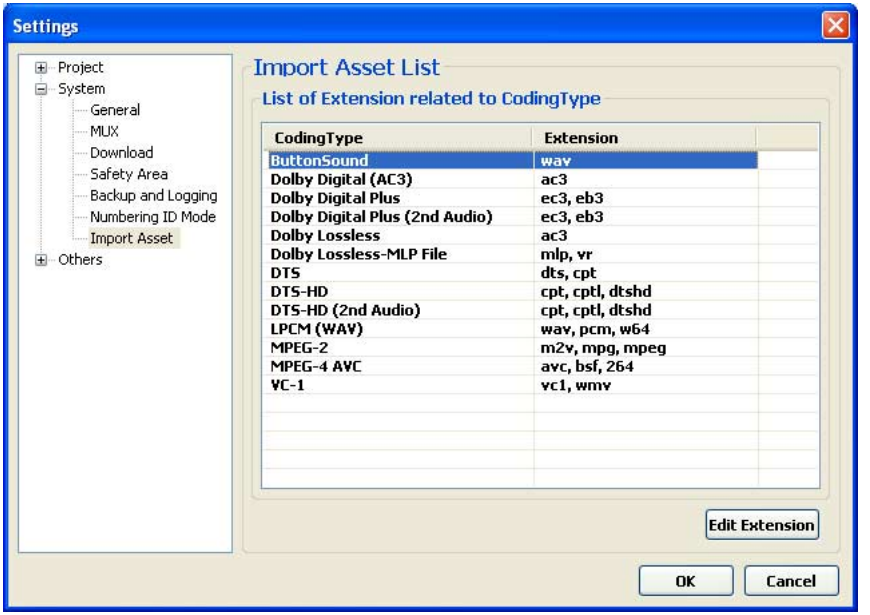


2 Expand the System item in the Tree view; then select Import Asset. The Import Asset List appears.



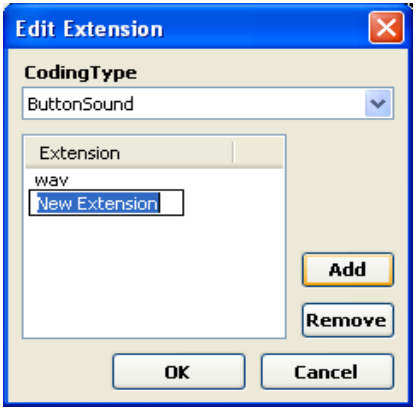
The Import Asset List shows all coding types, and all file extensions associated with each coding type.

3 To modify the Import Asset List, select the Coding Type whose extension list you want to edit.



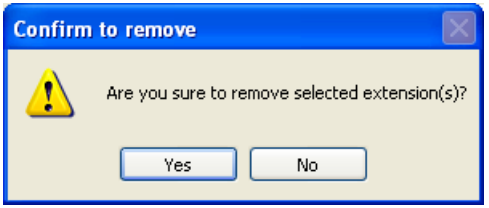
4 Click Edit Extension. The Edit Extension dialog box appears.

5 To add a file extension to the list, click Add. A New Extension placeholder appears in the list.



6 Type in the proper file extension; then click OK. The new extension appears in the Import Asset list.

7 To delete a file extension, select the extension in the Edit Extension dialog box; then click Remove. The program prompts you to confirm the deletion.



8 Click Yes. The extension is removed from the Import Asset list.

9 To edit another Coding Type, select it from the drop-down list.

10 When you are finished modifying the Import Asset List, click OK to close the Edit Extension dialog box; then click OK to close the Settings window.

Regenerating MUI files for older projects

If you want to work with a project created using an earlier version of Scenarist BD, you will need to regenerate the MUI files (for both video and audio assets), because the current version (version 4.5 Final) does not handle MUI files created using earlier versions.

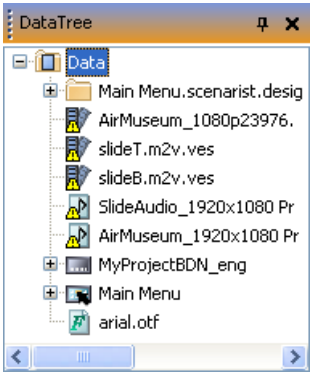
To regenerate MUI files for older projects:

1. Make sure that the version of the MUI generator you are using is the current version. (See the *Scenarist BD Release Notes* to determine the correct version number.)
2. Locate your elementary video and audio stream assets and their associated MUI files.
3. Delete the MUI files generated using the earlier version. For each asset, delete the following files:
   <filename>.mui
   <filename>.mui.txt
   <filename>.ves
   <filename>.xui
   <filename>.xui.txt

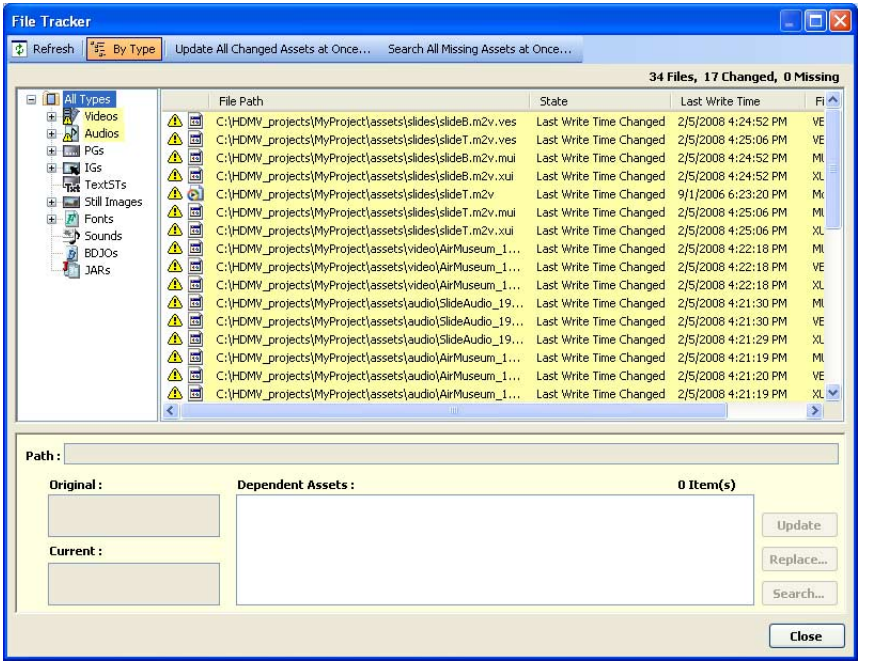
   Note: Later versions of the MUI generator do not generate the two .txt files.
4. For each asset, generate new MUI files, using the steps outlined in "Using the MUI Generator" on page 45.
5. Open your project in Scenarist BD. Because their last write time has changed, all of your video and audio assets appear with an Update marker in the Data Tree.

Note: For more information on status markers and what they mean, see "Asset status markers" on page 90.

For example:



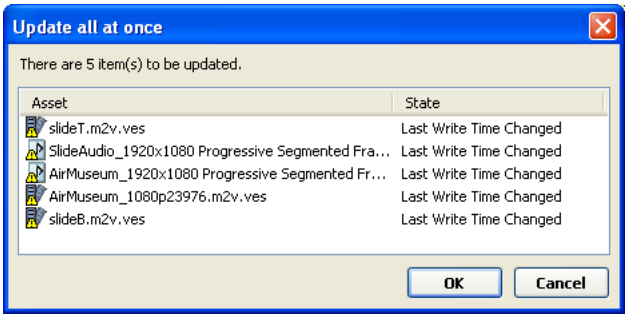
6 Choose File > File Tracker. The File Tracker window appears.



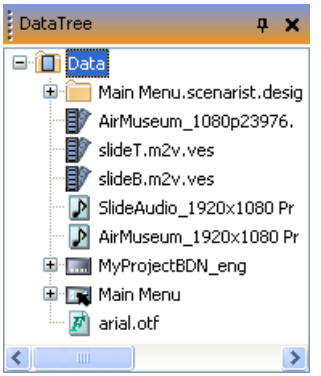
Note: For more information, see “Using the File Tracker” on page 96.

7 In the toolbar, select Update All Changed Assets at Once.

The Update all at once dialog box appears.



8 Click OK. Scenarist BD updates the listed video and audio assets.



Note: For more information on all aspects of asset management, see Chapter 6, “Managing assets,” on page 89.

6 Managing assets

This chapter documents managing assets in a Scenarist BD project. It includes the following topics:

- "Asset status markers" on page 90
- "Updating assets" on page 91
- "Finding missing assets" on page 92
- "Using the File Tracker" on page 96
- "Deleting assets" on page 102

Asset status markers

The icons for assets (in both the Data Tree and the Data Editor), give you information on the status of the assets. There are three status markers:

— Normal status: indicates that there has been no change in the file path, time stamp, or file size.

— Update status: indicates that the time stamp or file size has changed.

— Missing status: indicates that the file cannot be found at the file path.

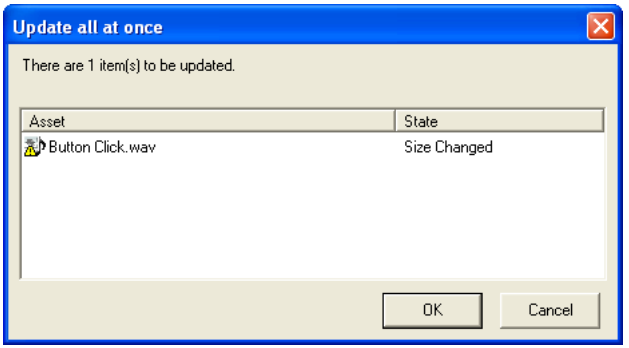
Asset status markers

Scenarist BD gives you a number of tools to manage assets: the Update utility, the Asset Finder, and the File Tracker. They allow you to update assets that have changed, locate or replace missing assets, and track the location and status of all assets related to your project. These tools are described in the sections below.

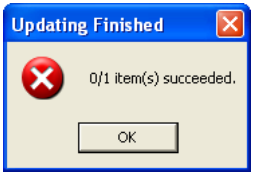
Updating assets

To update an asset:

1 In the Data Tree or Data Editor, right-click the asset(s) in need of updating, and choose Update from the shortcut menu. The Update dialog box appears.



2 Click OK. Scenarist BD updates the asset(s). An Updating Finished dialog box appears.

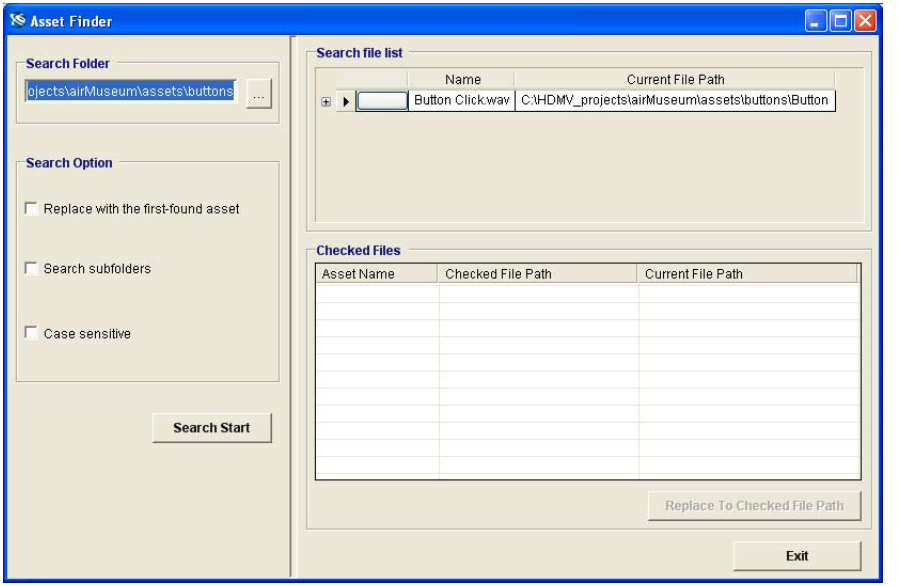


3 Click OK. The update process is complete.

Finding missing assets

To find a missing asset:

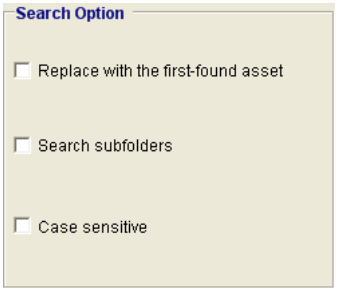
1 In the Data Tree or Data Editor, right-click the missing asset(s), and choose Search from the shortcut menu. The Asset Finder window appears.



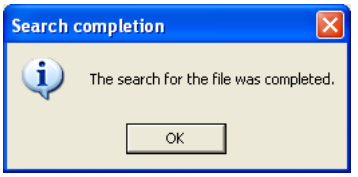
The list of missing assets appears in the Search file list group box.

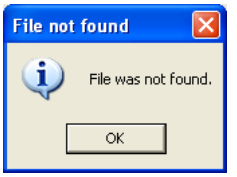
2 Click the Browse button next to the Search Folder field, and locate the folder in which you want to search for the missing asset.

3 Select the appropriate Search Options.

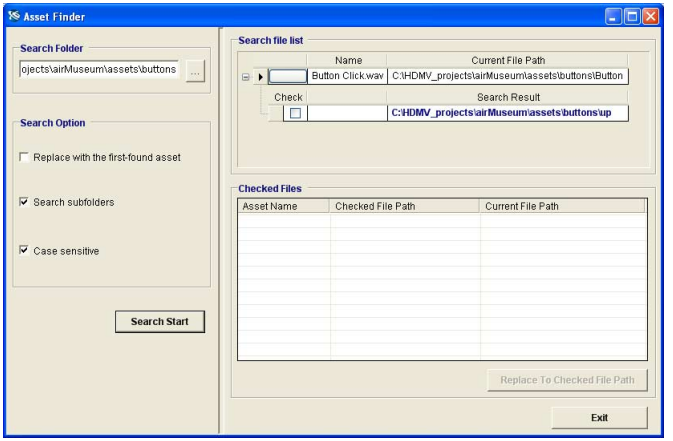


4 Click Search Start. Scenarist BD searches for the missing asset and reports the results of the search.

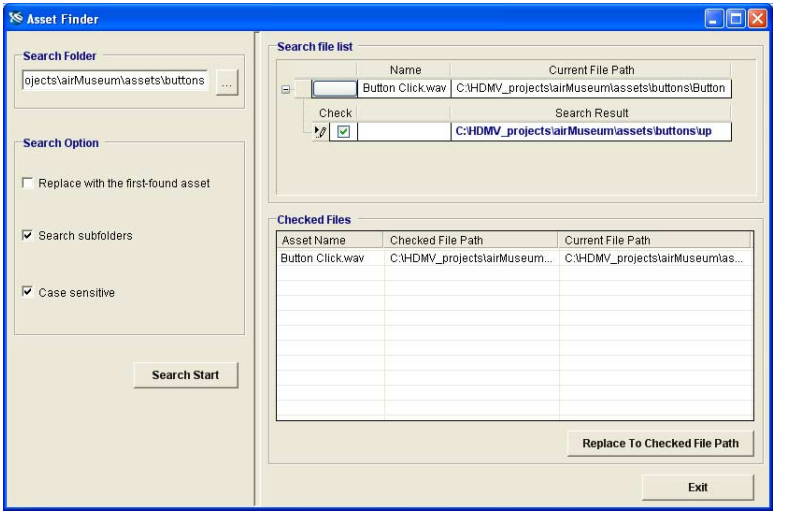




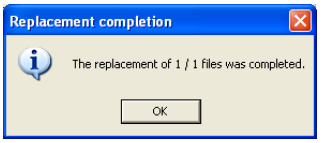
If the search has located the missing asset, the Asset finder shows the file name and new file path in a Search Result list, which appears in the Search file list group box.



5 To replace the file path to the missing asset with the file path that located the asset during the search, check the box to the left of the asset in the Search Result list. The asset appears in the Checked Files list box.

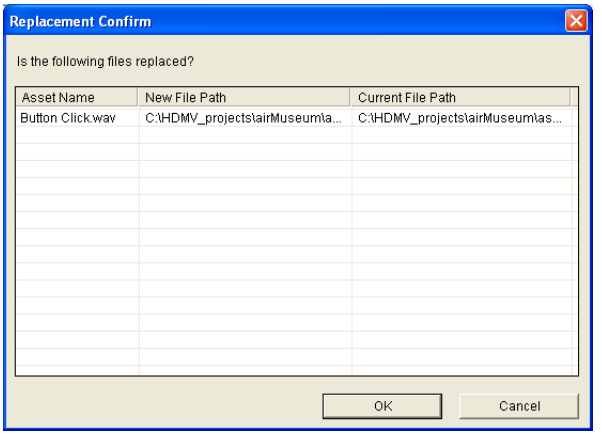


6 Click Replace to Checked File Path. Scenarist BD updates the file path to the asset, and reports on the result of the update.



7 Click OK. The missing asset (file path) is replaced by the new file path.

Note: If you choose the “Replace with first-found asset” Search Option, the file path replacement operation is different. As soon as an asset is found, the Replacement Confirm dialog box appears.



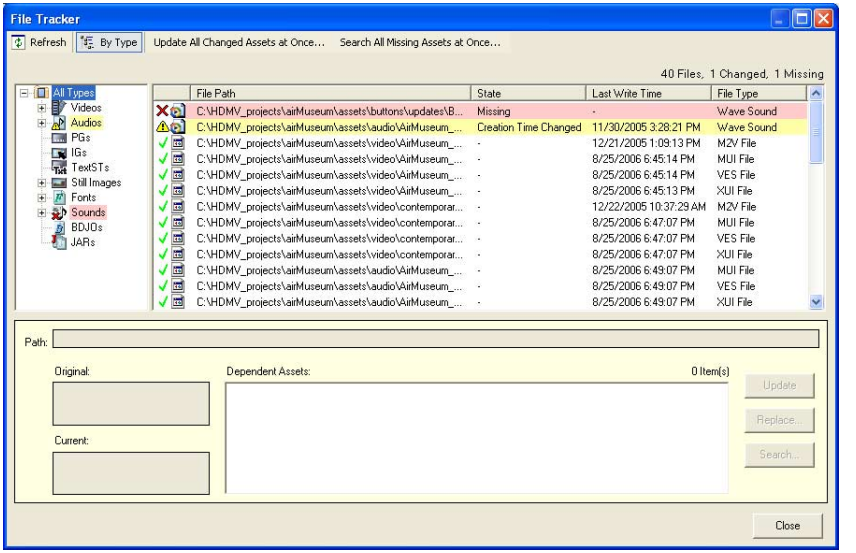
To replace the missing asset (file path) with the first-found asset (file path), click OK. Otherwise, click Cancel; then, change the Search Options in the File Tracker and initiate a fuller search. The “Replace with first-found asset” option is recommended only if you know the location of the asset, because it minimizes search time.

Using the File Tracker

The File Tracker gives you a simple way to manage all registered assets for your project. It supplies a complete list of registered assets, shows the status of each one, and gives you tools for updating, searching for, and replacing assets.

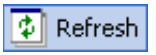
To use the file tracker:

1 Choose File > File Tracker. The File Tracker window appears.



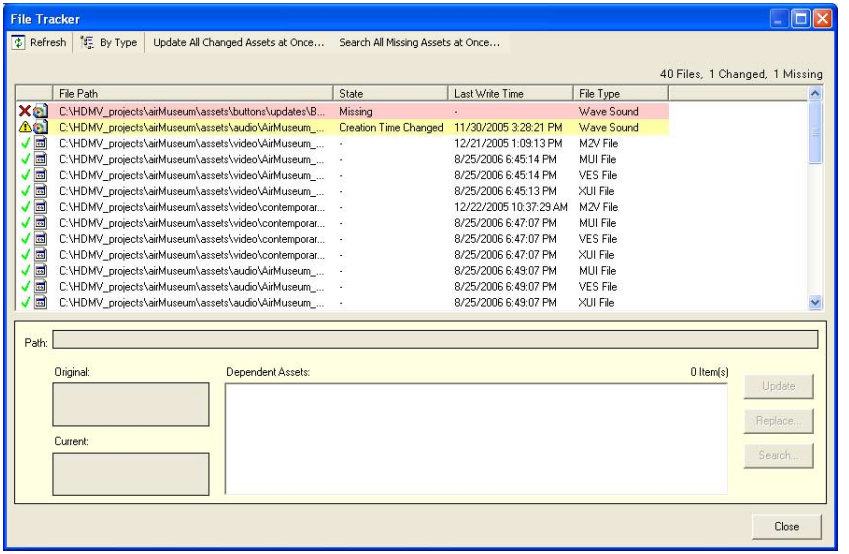
The window shows a complete list of all assets registered to your project. The list includes the registered File Path, the asset State (status), the Last Time Write (most recent update) and the File Type. The toolbar across the top gives you access to various functions.

2 To Refresh the File Tracker display, click Refresh.

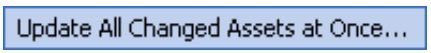


3 The File Tracker usually opens with the By Type option selected; this displays a tree view on the left side of the window (as shown above), and allows you to check the status of assets by type. To toggle this option off, click By Type.

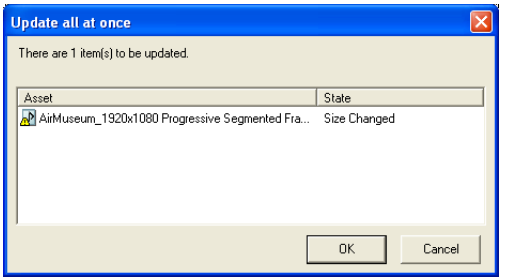
The tree view disappears, and the asset list fills the window.



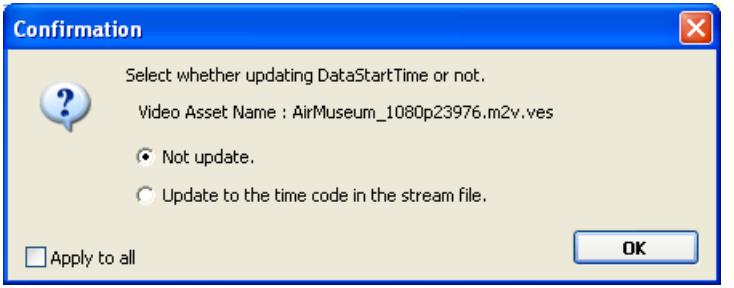
4 To update assets with Update status, click Update All Changed Assets at Once.



The Update all at once dialog box appears.



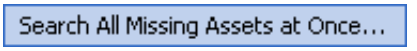
5 Click OK. For each asset, the program asks you to confirm whether or not to update the DataStartTime.



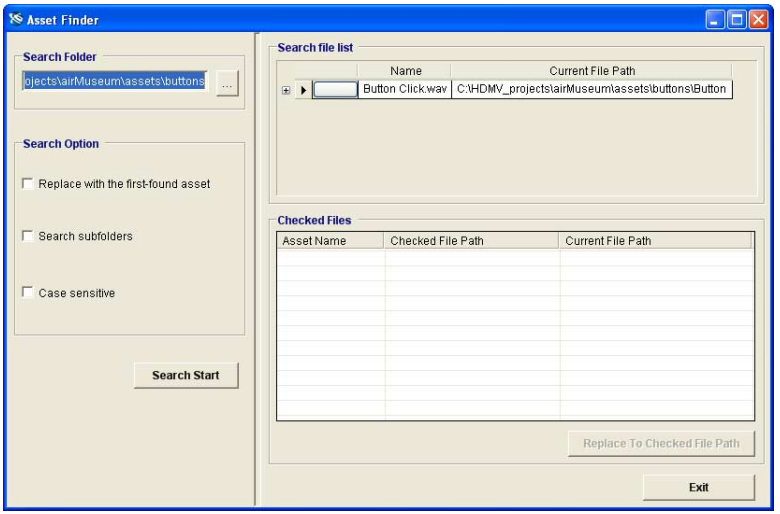
6 Select the appropriate option using the radio buttons. To apply the selected option to all assets being updated, click the Apply to all option to select (check) it.

7 Scenarist BD updates the listed assets.

8 To search for missing assets, click Search All Missing Assets at Once.



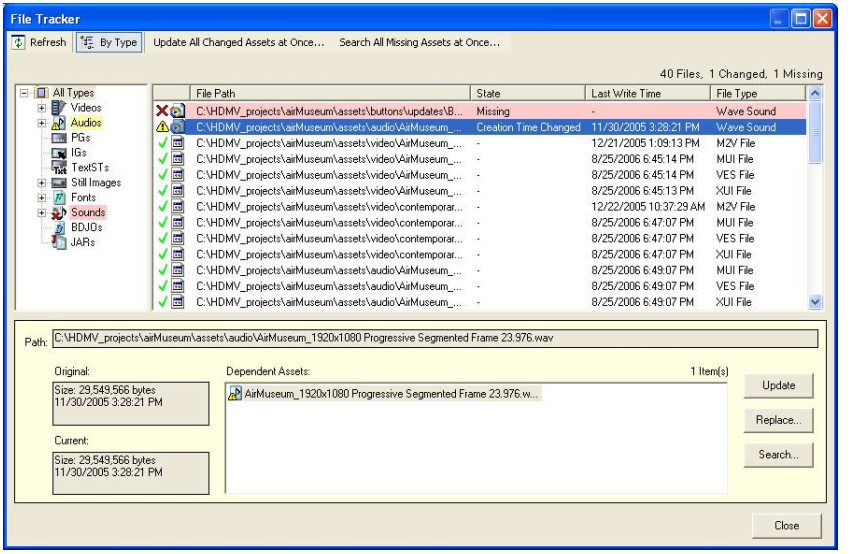
The Asset Finder window appears.



9 Use the Asset Finder to locate missing assets (see “Finding missing assets” on page 92).

10 To work with a single asset, select it from the asset list. The details for the selected asset appear in the area below the list.

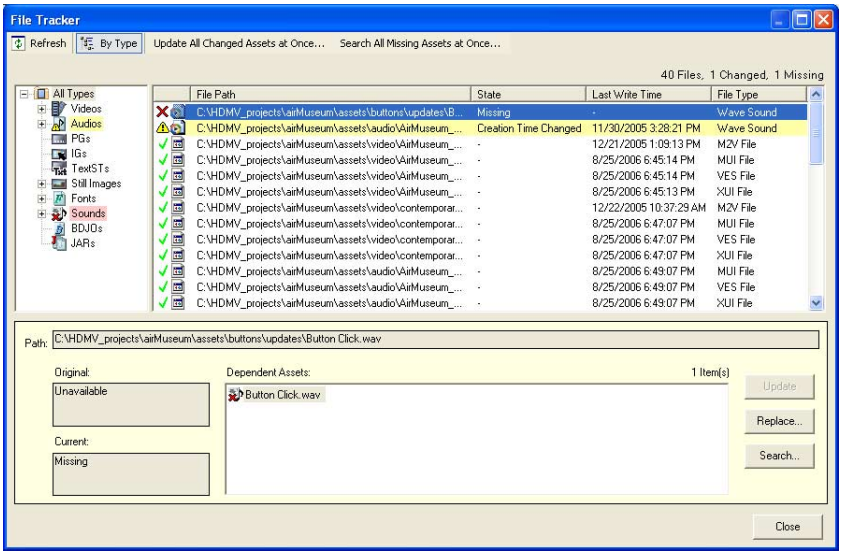
11 To update a single asset in need of updating, select it from the list so that its details appears in the lower portion of the window.



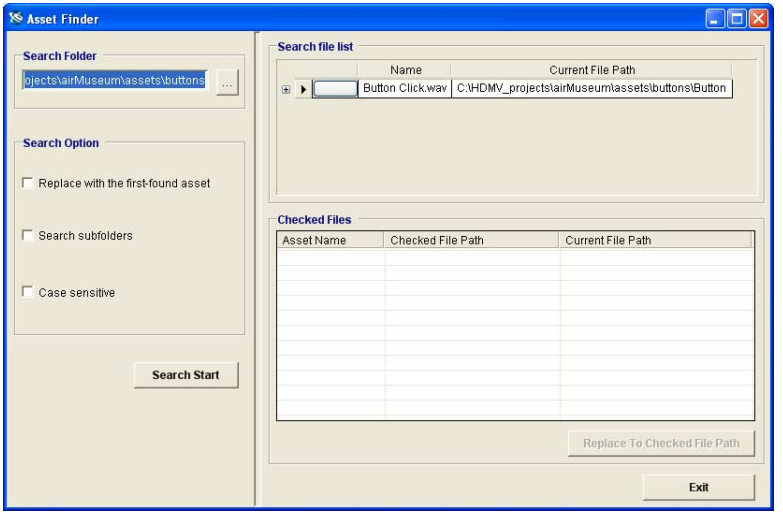
12 Click Update. Scenarist BD updates the asset. An Updating Finished dialog box appears

13 Click OK. The update process is complete.

14 To locate a single missing asset, select it from the list so that its details appears in the lower portion of the window.



15 Click Search. The Asset Finder appears.

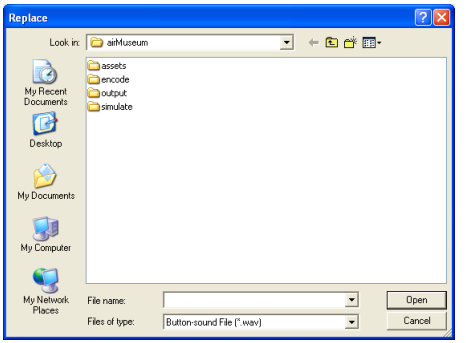


16 Use the Asset Finder to locate missing asset (see “Finding missing assets” on page 92).

17 To replace an asset, select it from the list so that its details appears in the lower portion of the window; then click Replace.

Note: The Replace function combines the Search and Update functions.

The Replace dialog box appears.



18 Locate the asset you want to use as a replacement for the selected asset; then click Open. The asset is replaced.

Deleting assets

It is easy to delete assets from a Scenarist BD project, including assets that are referenced by other objects.

Deleting unreferenced assets

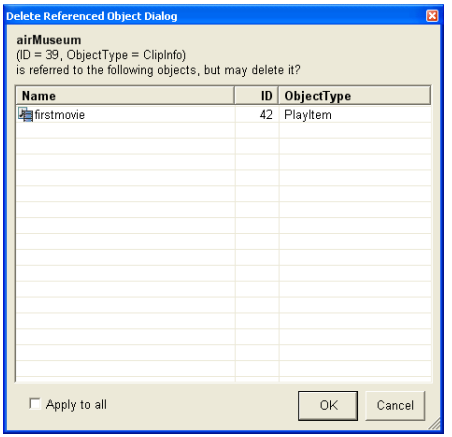
To delete an unreferenced asset:

- In the Data Tree or Data Editor, right-click the unreferenced asset you want to delete, and choose Delete from the shortcut menu. Scenarist BD deletes the asset from the project.

Deleting referenced assets

To delete a referenced asset:

1. In the Data Tree or Data Editor, right-click the referenced asset you want to delete, and choose Delete from the shortcut menu. The Delete Referenced Object dialog box appears.



   The dialog box gives the name and type of object at the top, and shows a list of all other objects to which it is referenced.

2. To delete the referenced object, click OK; to retain the object, click Cancel.

7 The Settings window

This chapter tells you how to use the Settings window. It includes the following topics:

- "Introduction" on page 106
- "Working with the Settings window" on page 106

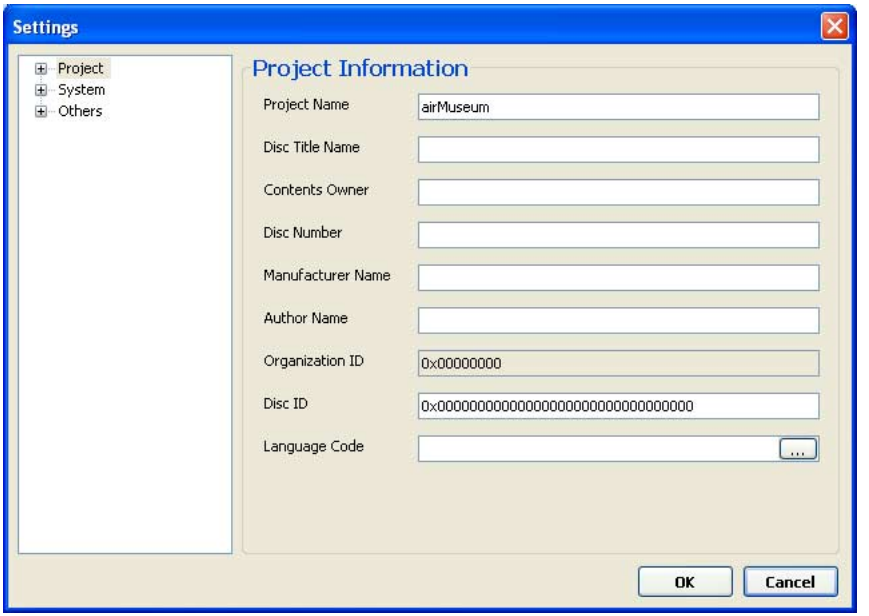
Introduction

The Settings window allows you to set or change basic information associated with your project. It also lets you establish operational norms for your work with Scenarist BD, including automatic backup and logging for your projects, asset import definitions, and designation of MUX and Download servers.

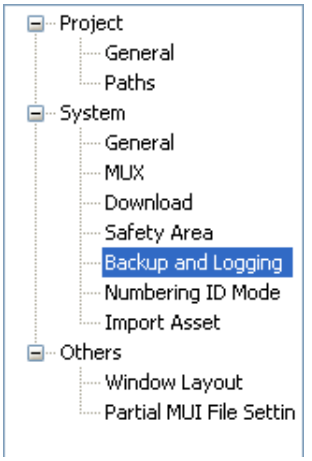
Working with the Settings window

To work with the Settings window:

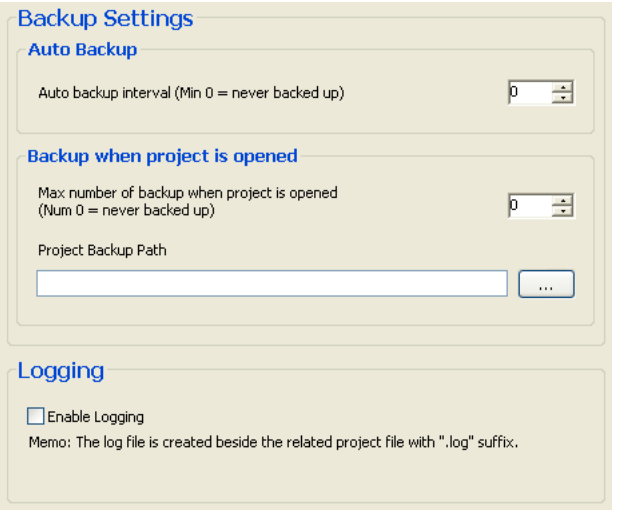
1 Choose Tool > Settings. The Settings window appears.



2 To select a particular group of parameters, expand the tree view; then select the page you want to work with. For example, select System > Backup and Logging in the tree view:



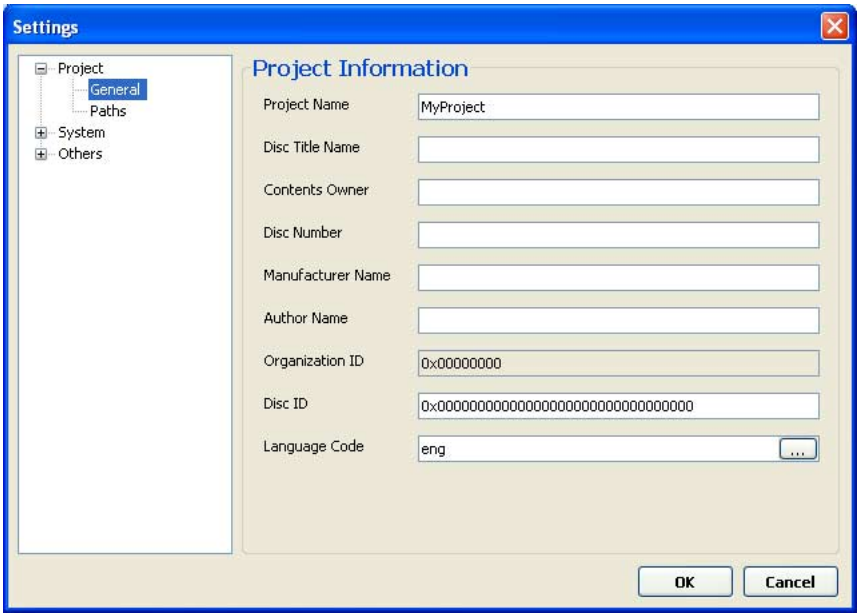
The Backup and Logging page appears on the right side of the window:



The following sections describe the pages of parameters that are available within the Settings window:

- “The Project > General page” on page 109
- “The Project > Paths page” on page 112
- “The System > General page” on page 114
- “The System > MUX page” on page 116
- “The System > Download page” on page 120
- “The System > Safety Area page” on page 124
- “The System > Backup and Logging page” on page 127
- “The System > Numbering ID Mode page” on page 129
- “The System > Import Asset page” on page 130
- “The Others > Window Layout page” on page 133
- “The Others > Partial MUI File Settings page” on page 136

The Project > General page



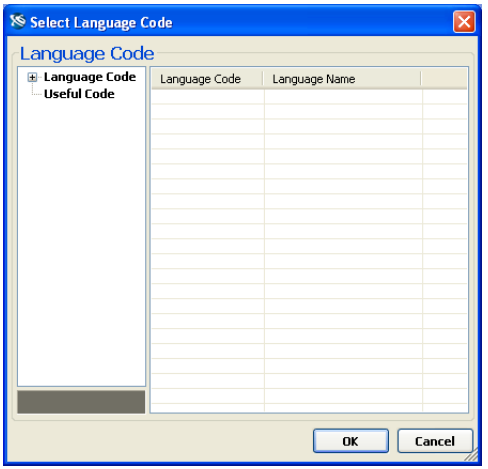
This page allows you to set or change the same group of parameters that are found in the Create New Project dialog box. For more information, see “Creating Disc Projects and Projects” on page 60.

To work with the Project > General page:

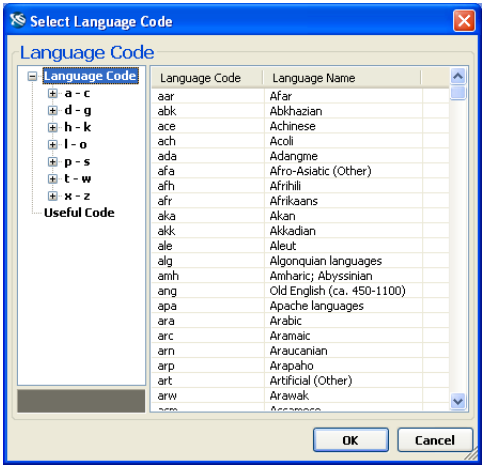
1 Enter or change optional data in the following fields:

- Project Name
- Disc Title Name
- Contents Owner
- Disc Number
- Manufacturer Name
- Author Name
- Organization ID (this is a read-only field)
- Disc ID

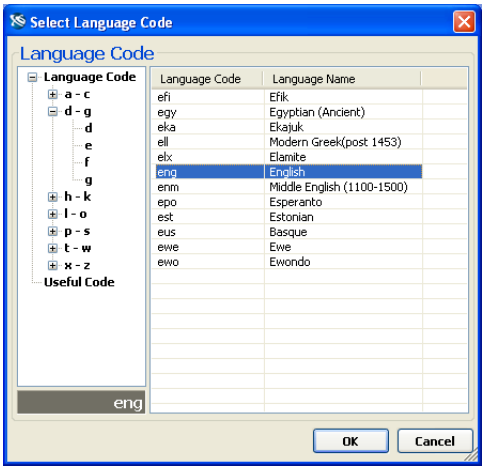
2 To change the default Language Code for a project, click the Browse button next to the Language Code field. The Language Code dialog box appears.



3 Click on Language Code in the tree view to expand it.



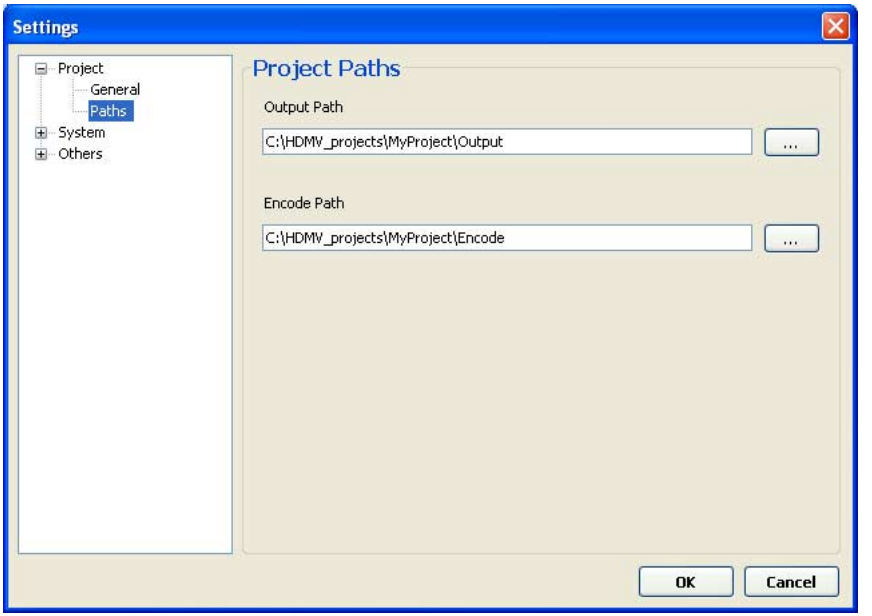
4 Using the tree view and the list view, select the language you want to use as the default for the project.



5 Click OK. The selected language appears as the default in the Language Code field of the Settings window.

Note: If you know the appropriate three-letter Language Code (for example, “eng” for English), you can type it in manually, instead of using the Browse button and the Language Code dialog box to select a Language Code.

The Project > Paths page

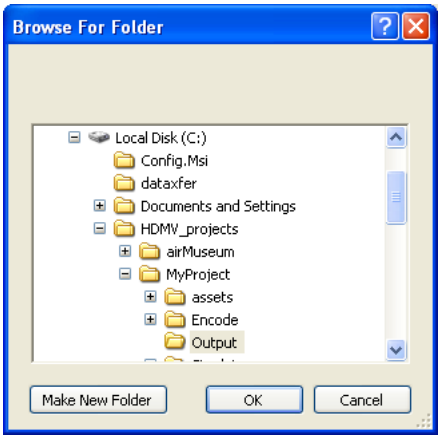


This page allows you change the paths to your project's Output folder and Encode folder.

Note: In order for the program to function properly, the destination folders must be named "Output" and "Encode." It is recommended that these folders reside within the same parent folder, along with the project file.

To work with the Project > Paths page:

1. Click the Browse button next to the Output Path field. The Browse for Folder dialog box appears, with the path to the current Output folder showing.

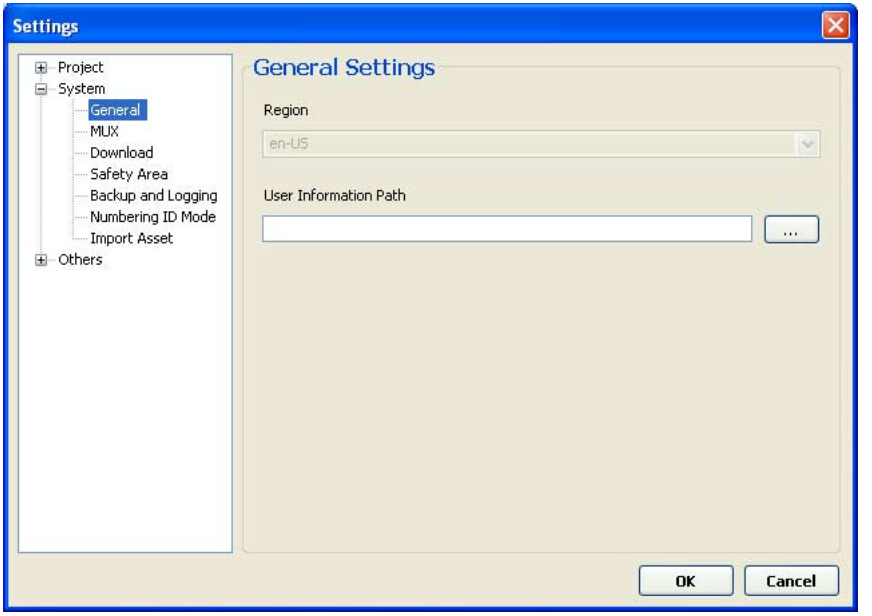


2. Create or select an Output folder in an appropriate location; then click OK. The new path appears in the Output Path field.

3. Click the Browse button next to the Encode Path field. The Browse for Folder dialog box appears, with the path to the current Encode folder showing.

4 Create or select an Encode folder in an appropriate location; then click OK. The new path appears in the Encode Path field.

The System > General page



This page allows you to set the User Information Path, which sets a storage location for the following information:

- Docking Layout for Scenarist BD's main windows.
- Window Position for the Scenarist BD application.

These settings are saved for each user who has login access to the computer.

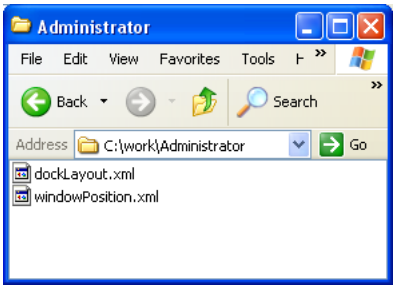
Note: The Region field on the System > General page is read-only.

To work with the System > General page:

1 Click the Browse button next to the User Information Path field. The Browse for Folder dialog box appears.

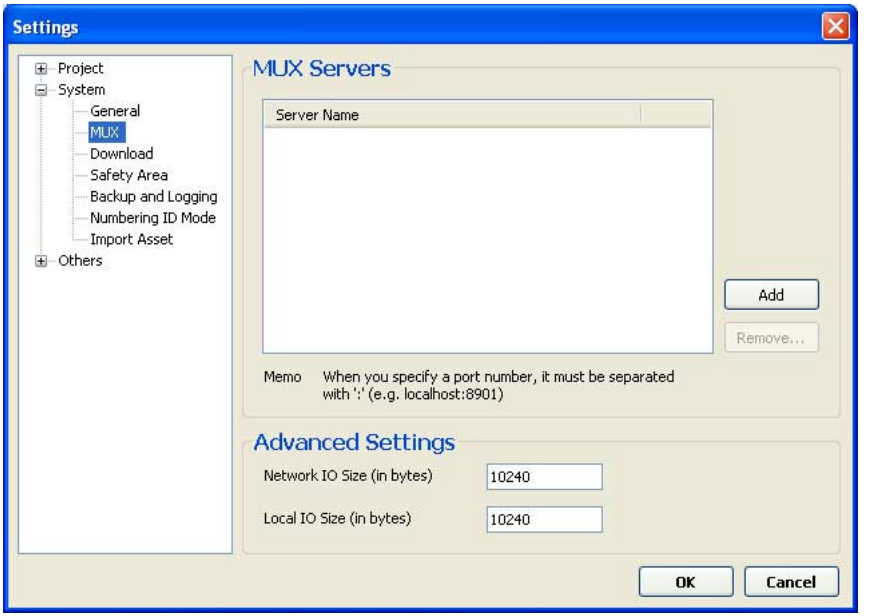
2 Create or select a folder for the User Information in an appropriate location; then click OK. The path appears in the User Information Path field.

The program creates a folder for each user inside the specified folder. For example, if the folder you create is called “work” (C:\work), the information for the Administrator is saved inside a nested “Administrator” folder:



Note: If no User Information path is set, these settings files are saved inside the main program folder for Scenarist BD.

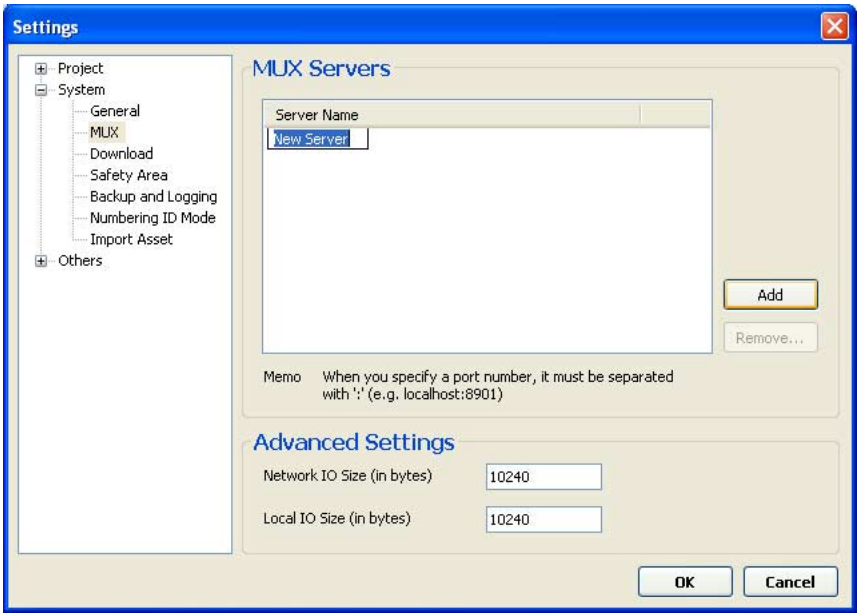
The System > MUX page



This page allows you to establish MUXing servers in addition to the default “localhost” server.

To work with the MUX page:

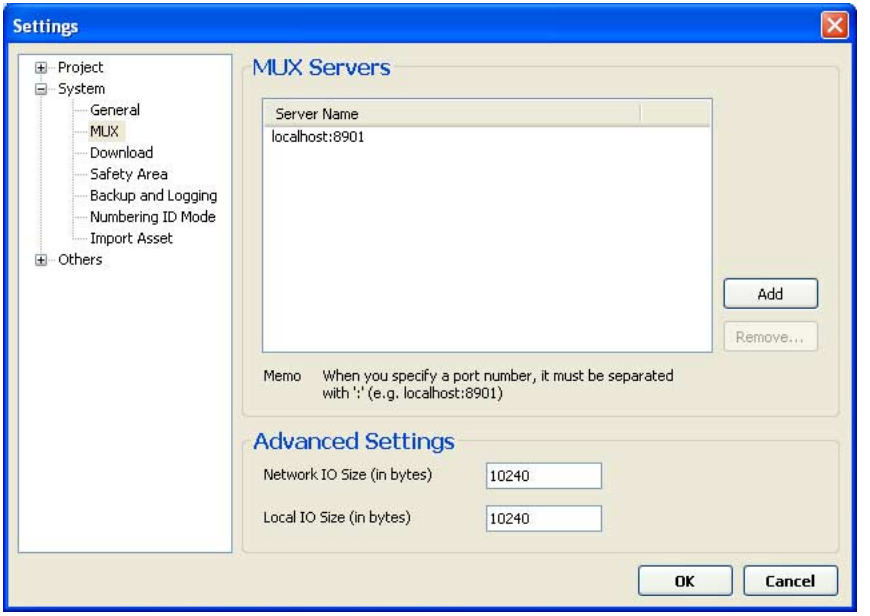
1 Click Add. A New Server placeholder appears in the Server Name list.



2 Type in the name of the server.

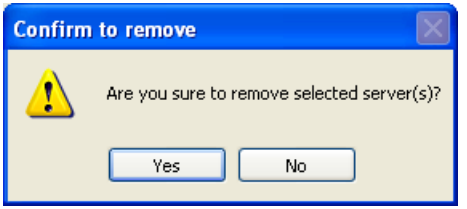
Note: When you specify a port number, it must be separated from the rest of the name by a (":") colon (for example, "localhost:8901").

3 Press Enter. The name is added to the Server Name list.



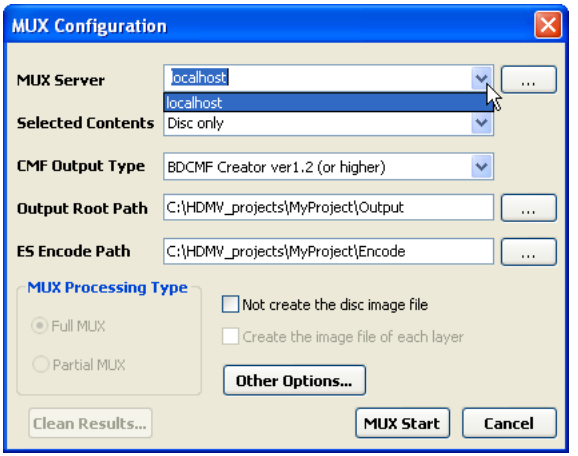
4 Continue adding names to the Server Name list as appropriate.

5 To delete a server name, select it in the Server Name list; then click Remove. The program prompts you to confirm the deletion.

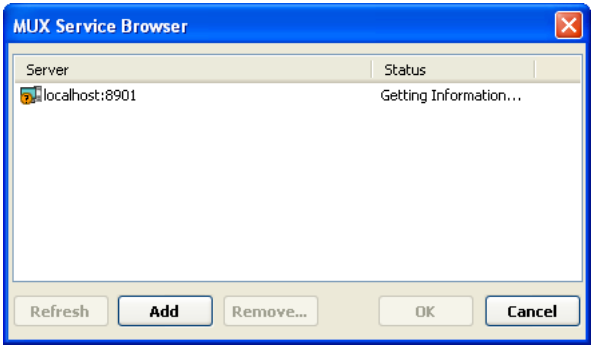


6 Click Yes. The name is removed from the Server Name list.

Note: When you open the MUX Configuration dialog box, your added server names do not appear automatically in the MUX Server drop-down list.

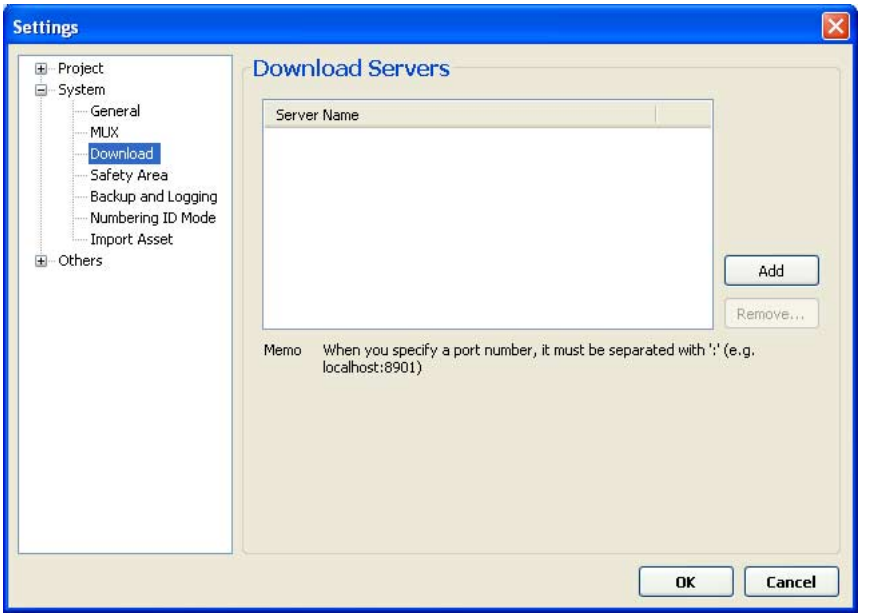


To access the new server names, click the Browse button next to the MUX Server field. The MUX Service Browser dialog box appears



Once the browser determines that the server is available, select it and click Add. Then Click OK. The server is added to the drop-down list in the MUX Server field of the MUX Configuration dialog box.

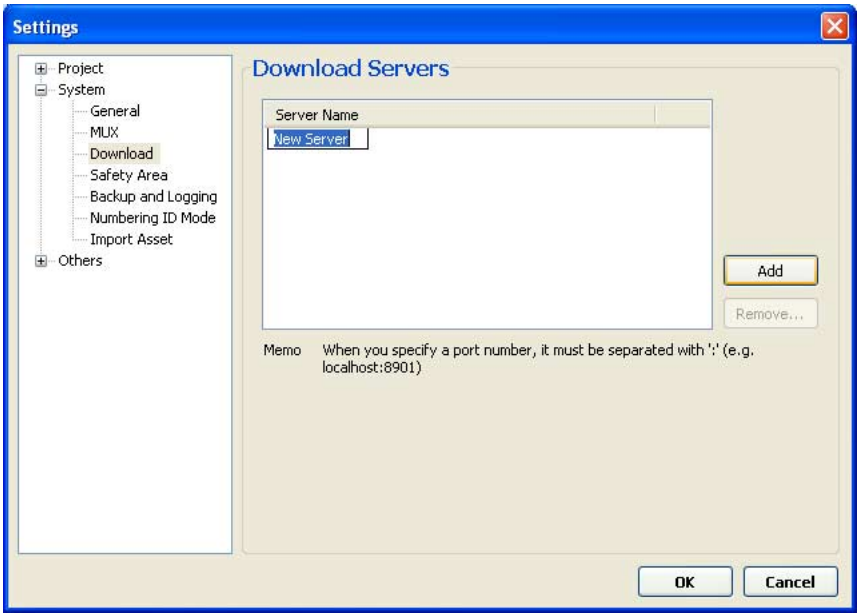
The System > Download page



This page allows you to establish download servers in addition to the default “localhost” server.

To work with the System > Download page:

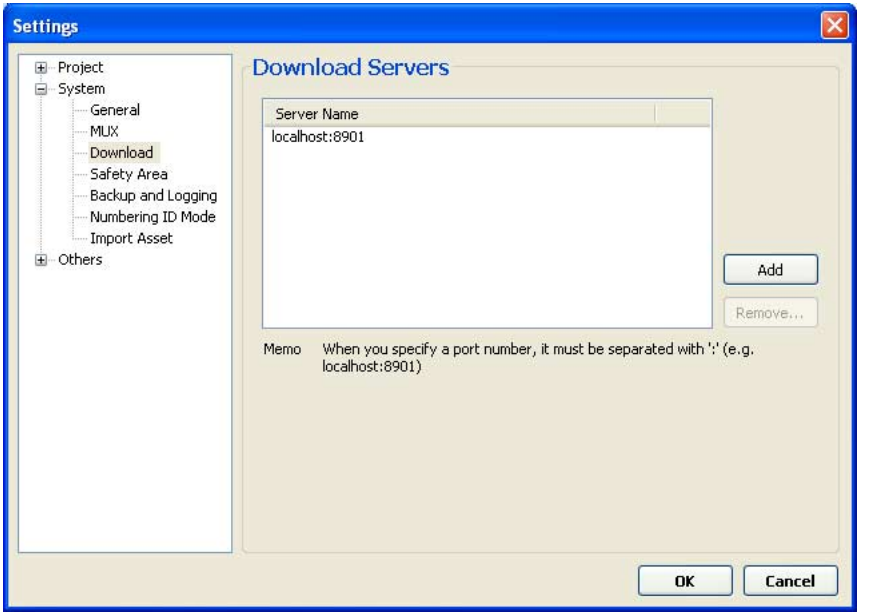
1 Click Add. A New Server placeholder appears in the Server Name list.



2 Type in the name of the server.

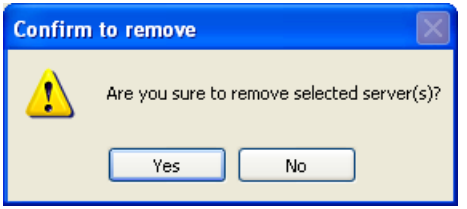
Note: When you specify a port number, it must be separated from the rest of the name by a (":") colon (for example, "localhost:8901").

3 Press Enter. The name is added to the Server Name list.



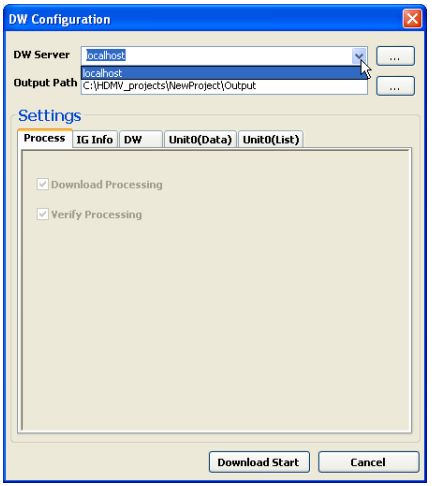
4 Continue adding names to the Server Name list as appropriate.

5 To delete a server name, select it in the Server Name list; then click Remove. The program prompts you to confirm the deletion.

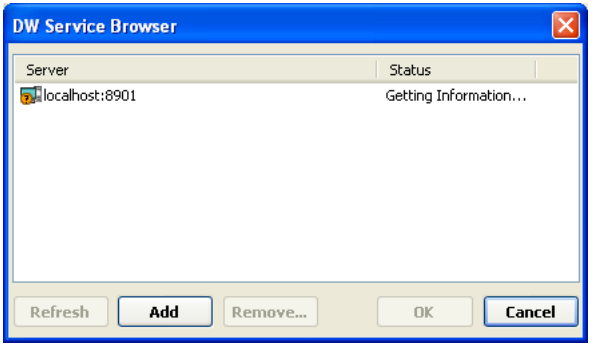


6 Click Yes. The name is removed from the Server Name list.

Note: When you open the DW Configuration dialog box, your added server names do not appear automatically in the DW Server drop-down list.

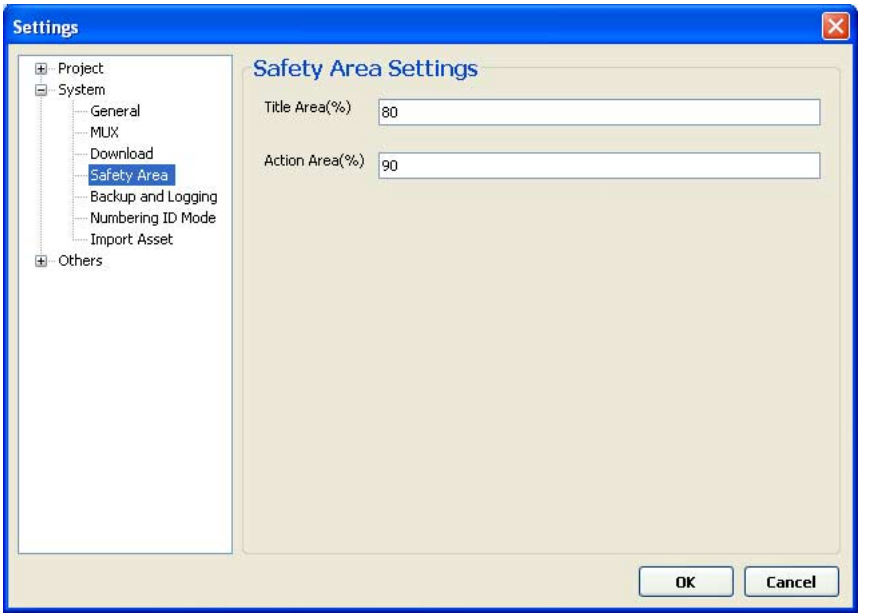


To access the new server names, click the Browse button next to the DW Server field. The DW Service Browser dialog box appears



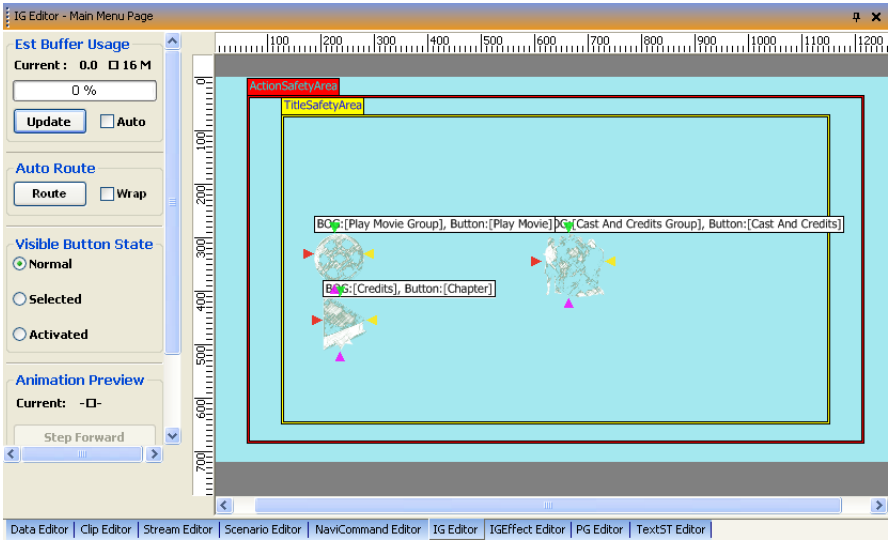
Once the browser determines that the server is available, select it and click Add. Then Click OK. The server is added to the drop-down list in the MUX Server field of the MUX Configuration dialog box.

The System > Safety Area page



This page allows you to set values (as percentages) for the Action Safety Area and Title Safety Area within the video display field. These areas are displayed in the IG Editor, IG Effects Editor, PG Editor, and TextST Editor in Scenarist BD.

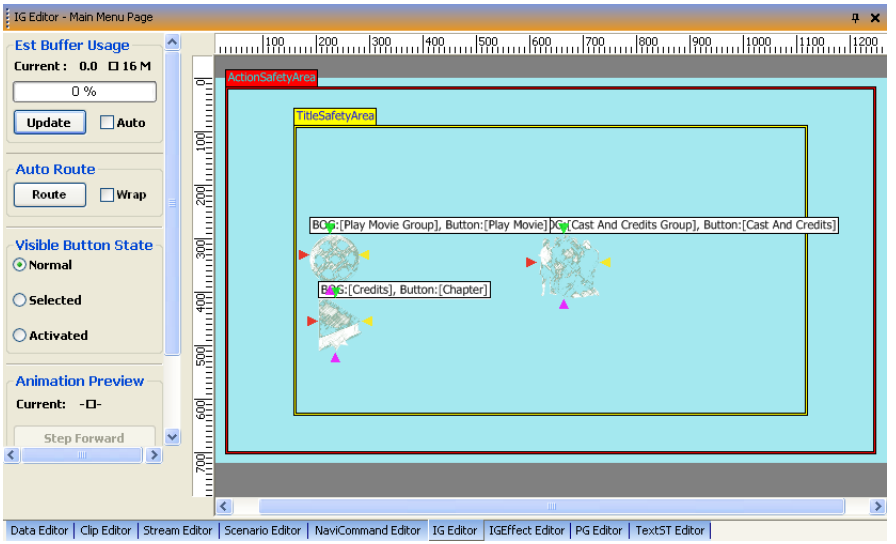
The default values are 80% for the Title Area and 90% for the Action Area.



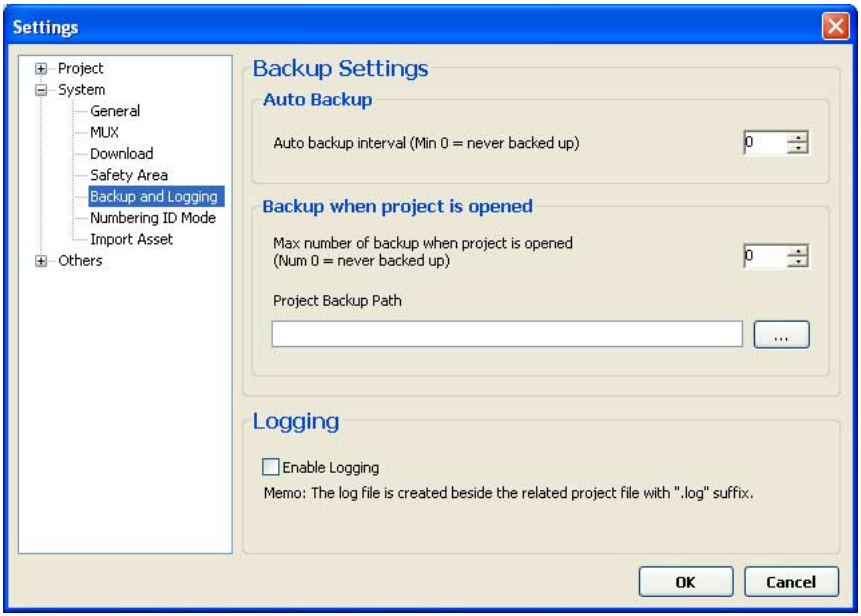
To work with the System > Safety Area page:

1. If appropriate, enter a new percentage value for the Title Safety Area in the Title Area field.
2. If appropriate, enter a new percentage value for the Action Safety Area in the Title Area field.

The new values are reflected in the various graphic Editors. For example, settings of 75% for the Title Area and 95% for the Action Area appear as follows in the IG Editor:



The System > Backup and Logging page



This page allows you to establish automatic backups and logging for your project.

To work with the System > Backup and Logging page:

1 In the Auto Backup group box, use the up and down arrows to set an interval (in minutes) for an automatic backup of your project. For example, if you set the interval to 5, Scenarist BD will back up your project every 5 minutes.

Note: If you set the value to 0, there will be no automatic backup operation.

2 In the Backup when project is opened group box, use the up and down arrows to set the maximum number of backup operations that Scenarist BD will perform while the project is open.

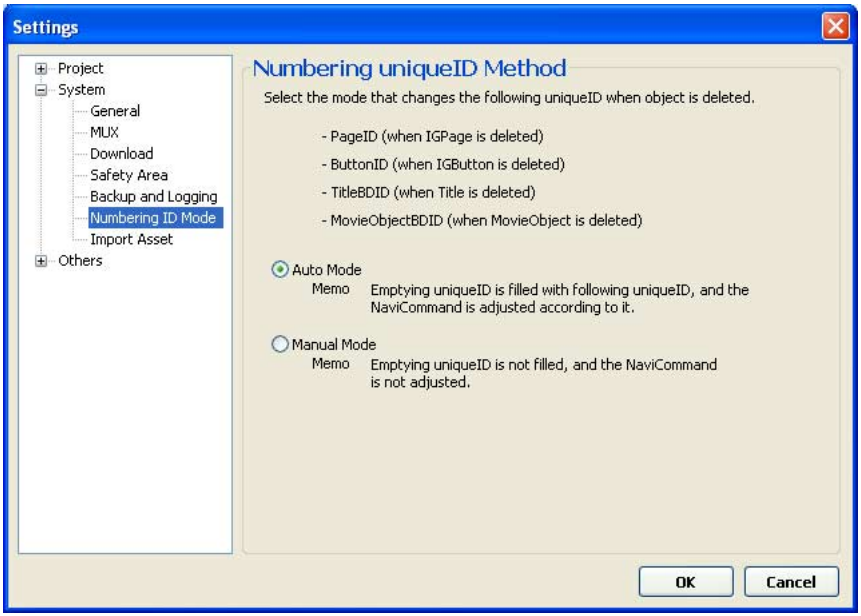
Note: If you set the value to 0, there will be no automatic backup operations.

3 Click the Browse button next to the Project Backup Path field. The Browse for Folder dialog box appears.

4 Create or select an Output folder in an appropriate location; then click OK. The path appears in the Project Backup Path field.

5 In the Logging group box, click the Enable Logging checkbox to activate the option (if appropriate).

The System > Numbering ID Mode page



This page allows you to choose a method for Scenarist BD to deal with uniqueID numbers for the following objects when one of the objects is deleted:

- IG Page (PageID is the uniqueID number)
- IG Button (ButtonID is the uniqueID number)
- Title (TitleBDID is the uniqueID number)
- Movie Object (MovieObjectBDID is the uniqueID number)

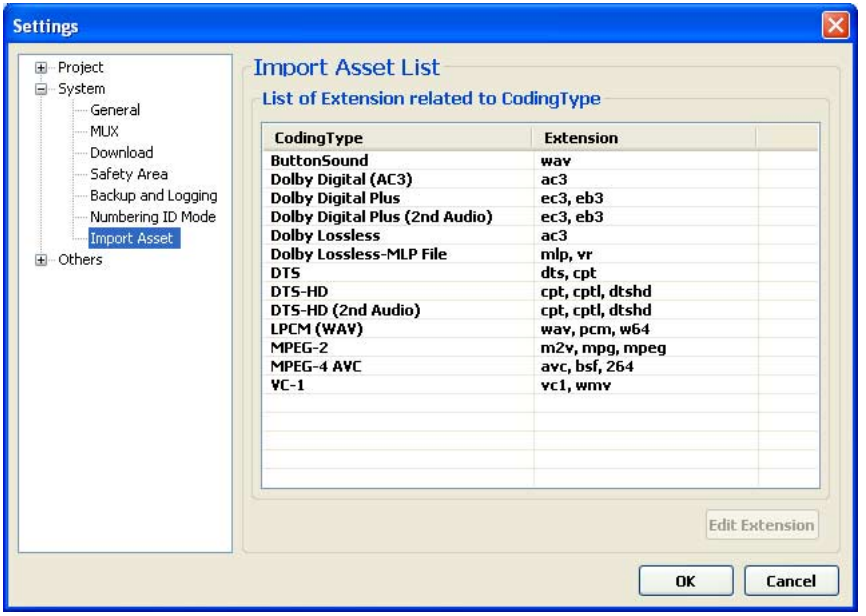
Note: These numbering options work only with the objects listed above, and only when one of these objects is deleted. It does not affect ID numbering if IG Buttons, Titles, or Movie Objects change position. For example, if you move an IG Button to a new location, the numbering will not change, so you will need to change the ID numbers and associated NaviCommands manually. However, if IG Pages are moved, the ID numbers change, and the NaviCommands update.

To work with the System > Numbering ID Mode page:

◆ Click on one of the radio buttons to select the option you prefer.

- **Auto Mode** changes numbering automatically to reflect a deletion, and all associated NaviCommands are adjusted accordingly.
- **Manual Mode** makes no change in the existing number to reflect a deletion. You will need to change the ID numbers and associated NaviCommands manually, so they will work properly.

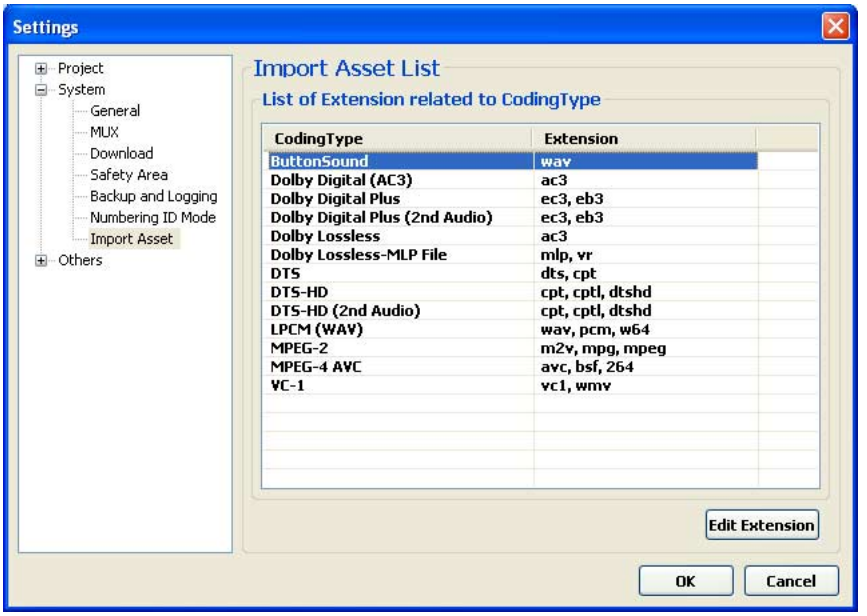
The System > Import Asset page



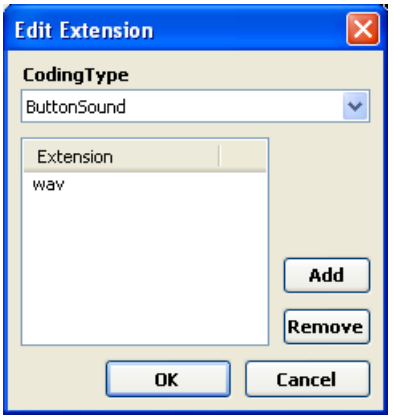
This page allows you to add to (or subtract from) the list of file types recognized by the program, or to associate specific file extensions to specific coding types. The Import Asset List shows all coding types, and all file extensions associated with each coding type.

To work with the System > Import Asset page:

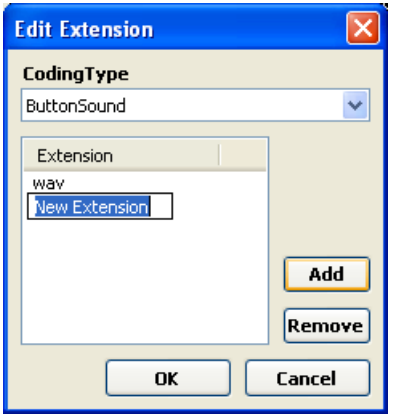
1 To modify the Import Asset List, select the Coding Type whose extension list you want to edit.



2 Click Edit Extension. The Edit Extension dialog box appears.

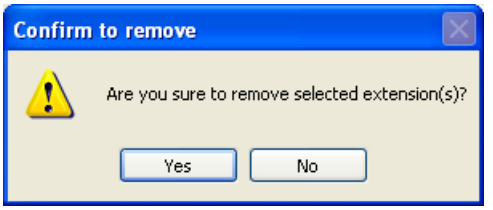


3 To add a file extension to the list, click Add. A New Extension placeholder appears in the list.



4 Type in the proper file extension; then click OK. The new extension appears in the Import Asset list.

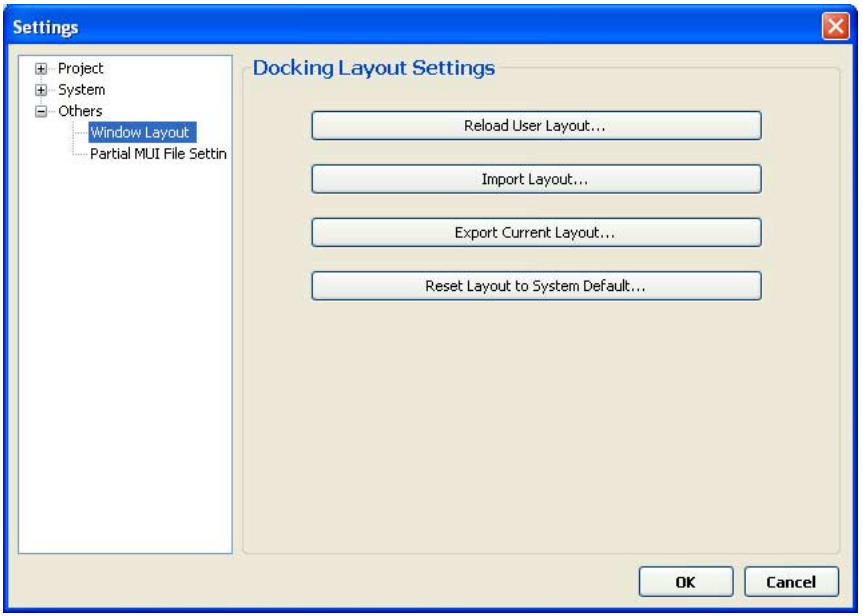
5 To delete a file extension, select the extension in the Edit Extension dialog box; then click Remove. The program prompts you to confirm the deletion.



6 Click Yes. The extension is removed from the Import Asset list.

7 To edit another Coding Type, select it from the drop-down list.

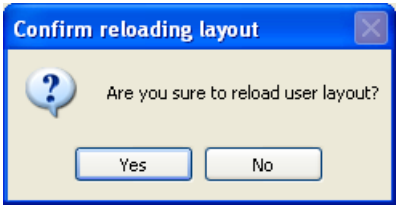
The Others > Window Layout page



This page gives you various options for working with the file that sets the docking layout for Scenarist BD's main windows (dockLayout.xml).

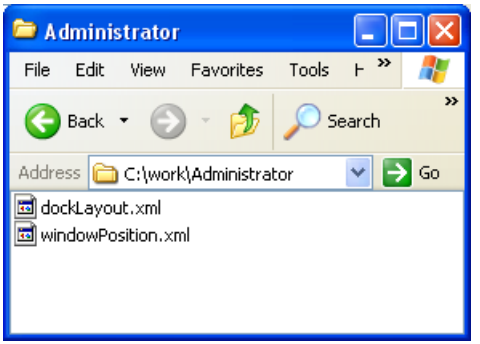
To work with the Others > Docking Layout page:

1 To reload your layout, click Reload User Layout. The program asks you to confirm the reload.



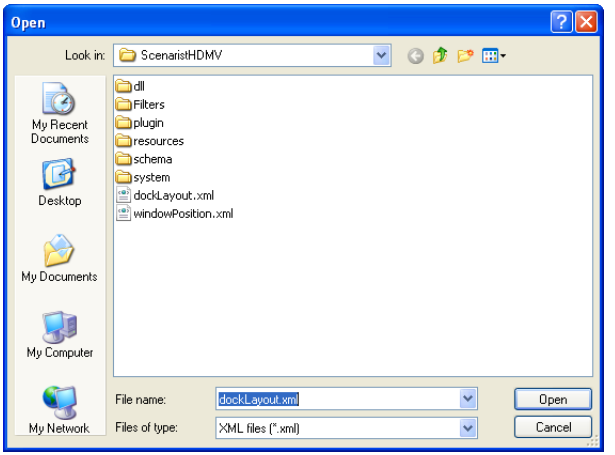
2 Click Yes. Your layout is reloaded.

Note: If you have set a User Information path (for information, see "The Project > Paths page" on page 112), the program reloads the dock layout information for the login user. For example:



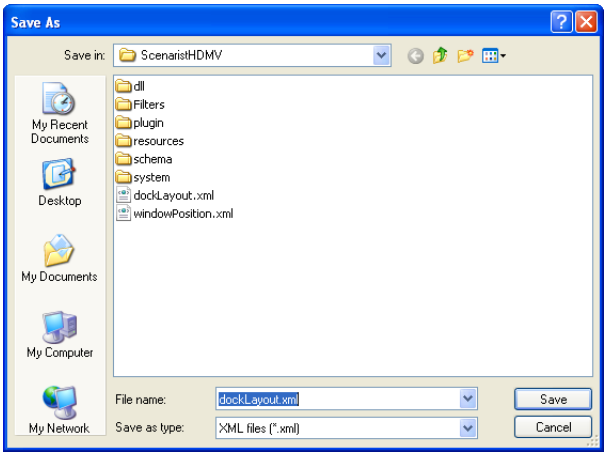
If there is no specific user layout for the login user, the program reloads the dock layout file stored in the main program folder for Scenarist BD.

3 To import a specific dock layout, click Import Layout. The Open dialog box appears.



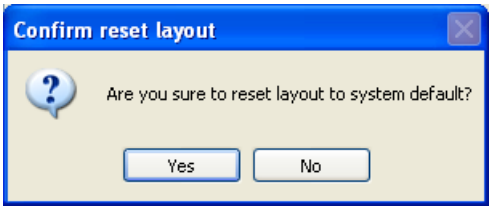
4 Locate the dock layout file (dockLayout.xml) you want to use; then click Open. The program loads the selected layout.

5 To save the current dock layout, click Export Current Layout. The Save as dialog box appears.



6 Select an appropriate location for the file; then click Save. The program saves current dock layout file to the selected location.

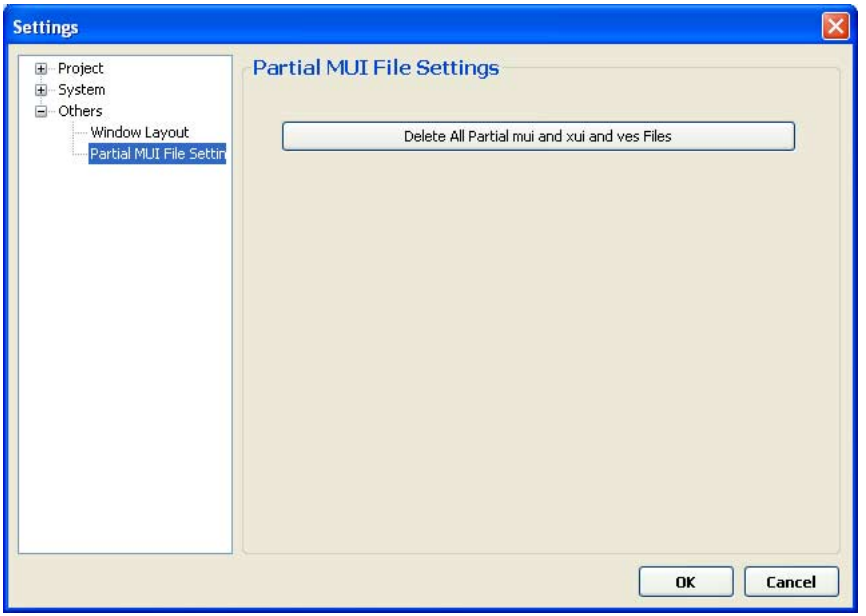
7 To load the system default dock layout, click Reset Layout to System Default. The program asks you to confirm the reset.



8 Click Yes. The program reloads the default dock layout.

Note: You can also perform this operation from the program's menu bar, by choosing Window > Default Layout.

The Others > Partial MUI File Settings page

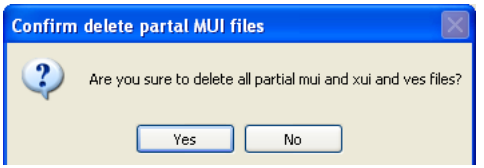


This page allows you to delete the temporary mui, xui, and ves files that are generated when portions of ES (elementary stream) files are specified. This operation is recommended for all of your projects before you upgrade Scenarist BD to a newer version.

Note: This operation does not delete the mui, xui, and ves files that are created by the MUI Generator (as described in “Using the MUI Generator” on page 45).

To work with the Others > Partial MUI File Settings page:

1 Click Delete all partial mui and xui and ves files.



2 Click Yes. The partial mui files are deleted.

8 Movies and slideshows

This chapter documents how to create movies and slideshows using Clips and PlayLists. It includes the following topics:

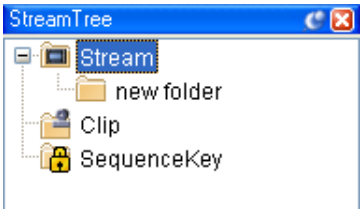
- "Creating Stream Tree folders" on page 140
- "Movie Clips and PlayLists" on page 140
- "Creating movie Clips and PlayLists automatically" on page 145
- "PlayList In/Out Settings" on page 147
- "PlayListMarks" on page 151
- "Slideshow PlayLists" on page 164
- "PlayLists with multiple PlayItems" on page 170
- "Masking user operations" on page 172

Creating Stream Tree folders

The Stream Tree has two main parent folders: a *Stream* folder that holds the project's PlayLists and PlayItems, and a *Clip* folder that holds the project's Clips. Additional folders can be added to the Stream folder and Clip folder to further organize the project's PlayLists and Clips.

To add Stream Tree folders:

1. Click the Stream Tree tab in the Tree window.
2. In the Stream Tree, right-click the folder to which you will add the new Clip folder or Stream folder, and choose New > Folder from the shortcut menu. A new folder is added to the Stream Tree.



3. To rename the new folder, click its name twice so it becomes selected, enter the new name, and press Enter.

Movie Clips and PlayLists

The following topics document how to create a movie PlayList by creating a basic movie Clip and adding it to a PlayList:

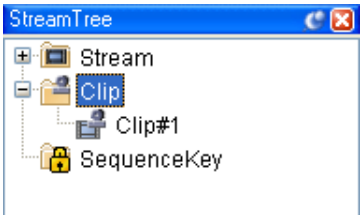
- "Creating movie Clips" on page 141
- "Creating movie PlayLists" on page 143

Creating movie Clips

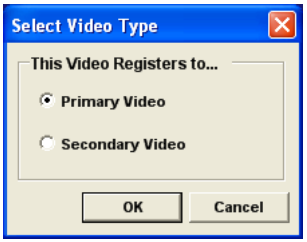
Before you can construct a movie PlayList, you have to first create the Clips that will be called by the PlayList. The following procedure documents how to create a basic movie Clip containing a video and an audio track. Movie Clips are created by dragging video and audio assets from the Data Tree into the Clip Editor.

To create a movie Clip:

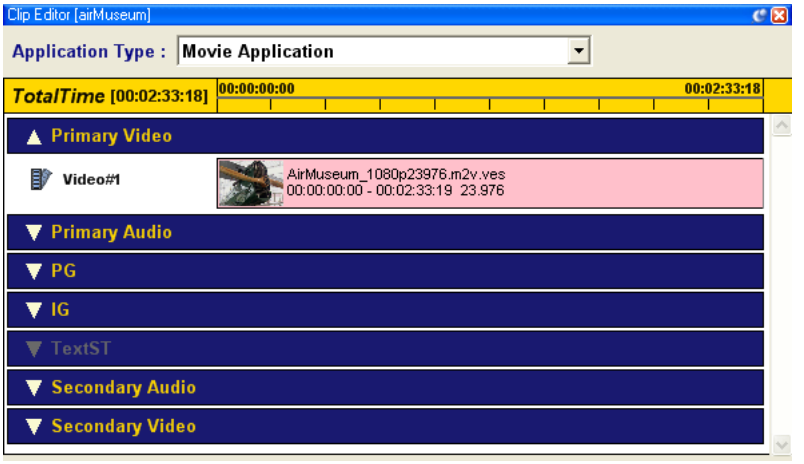
1. In the Stream Tree, right-click the Clip folder to which you will add the movie Clip, and choose Edit > New > Clip > Movie Application from the shortcut menu. A new Clip is added to the folder.



2. To rename the Clip, in the Stream Tree, click its name twice so it becomes selected, enter the new name, and press Enter.
3. Double-click the Clip to display it in the Clip Editor.
4. Drag a movie asset from the Data Tree onto the Video track in the Clip Editor. The Select Video Type dialog box appears.



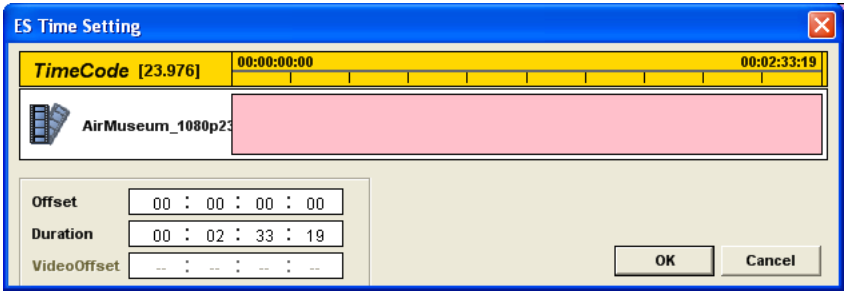
5 Make sure that Primary Video is selected; then click OK. Video is added to the track, and the asset's name, thumbnail, and start and end points are displayed in the track.



6 Drag an audio asset from the Data Tree onto the Primary Audio track in the Clip Editor. Audio is added to the track, and the asset's name and start and end points are displayed in the track.

7 To set an offset or duration for either the video track or audio track, do the following:

- Double-click the track for which you will set the offset or duration. The ES Time Setting dialog box appears.



- If there is material at the beginning of the asset that you don't want to use, enter the location from where the Clip will begin playing in the Offset field in hours, minutes, seconds, and frames.
- To specify how long the asset will play, enter a value in the Duration field in hours, minutes, seconds, and frames.
- Click OK to close the ES Time Setting dialog box.

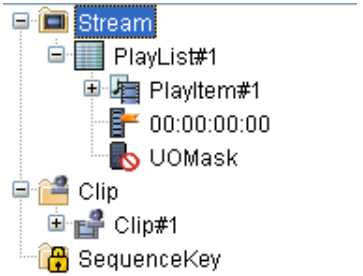
Note: For information on adding interactive graphics and presentation graphics to movie Clips, see Chapter 10, "Interactive graphics," and Chapter 12, "Presentation graphics."

Creating movie PlayLists

Movie PlayLists are constructed in the Stream Editor by dragging movie Clips from the Stream Tree into the PlayItem track. The following procedure documents how to create a movie PlayList with a single PlayItem that points to a single movie Clip.

To create a movie PlayList:

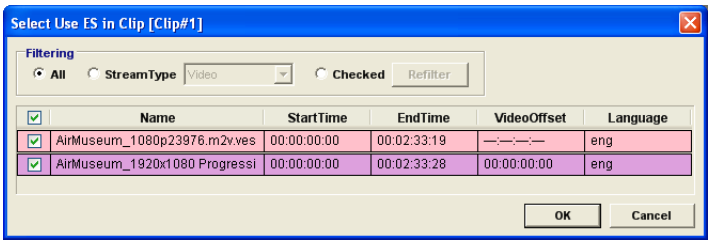
1 In the Stream Tree, right-click the stream folder to which you will add the PlayList, and choose Edit > New > PlayList from the shortcut menu. A new PlayList and a new PlayItem are added to the folder.



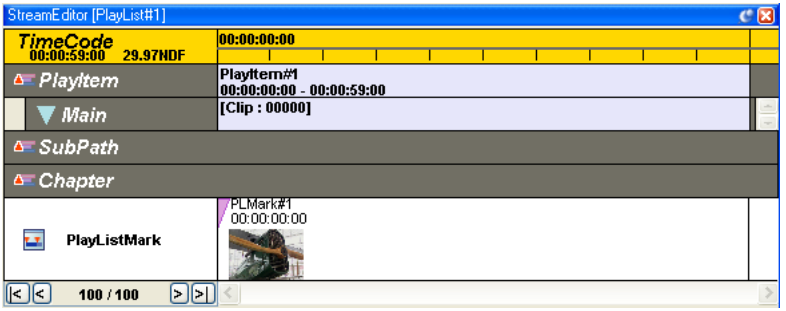
2 To rename the PlayList, in the Stream Tree, click its name twice so it becomes selected, enter the new name, and press Enter.

3 Double-click the PlayList to display it in the Stream Editor. A blank Clip is displayed in the PlayItem track.

4 Drag a movie Clip from the Stream Tree onto the blank Clip in the PlayItem track in the Stream Editor. The Select Use ES in Clip dialog box appears.



5 Select the appropriate type of filtering; then click OK. The Clip's video and audio tracks are displayed in the Stream Editor.



Note: The Stream Editor has a toolbar button that allows you to turn PlayListMark (chapter) thumbnail images On or Off. When you first open Scenarist BD, this feature is set to Off. In order to see the PlayListMark thumbnail image as shown above, you need to turn thumbnail images On. For more information, see "PlayListMark thumbnail images" on page 151.

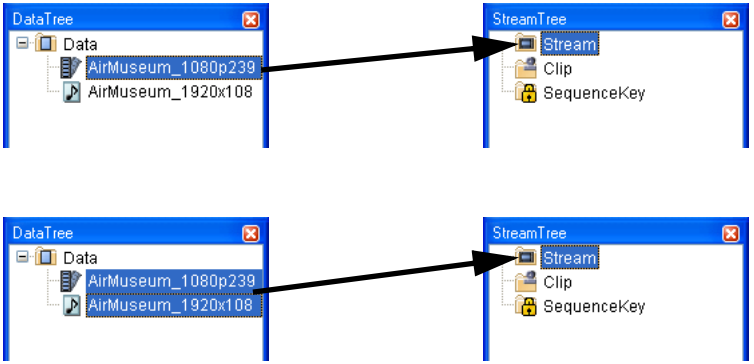
Creating movie Clips and PlayLists automatically

Instead of building movie Clips and PlayLists step by step, as described in "Movie Clips and PlayLists," above, it is possible to create them using a single operation.

To create a movie Clip and PlayList in a single operation:

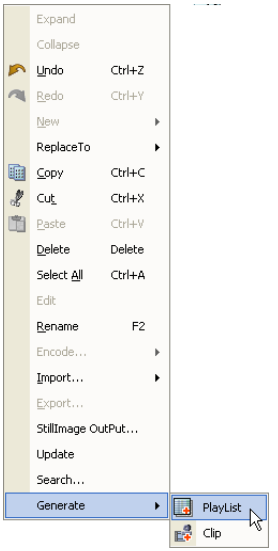
1 Do one of the following:

- Select one or more Video/Audio/IG/PG assets in the Data Tree (or Data Editor); then, drag the selected asset(s) to the (root) Stream folder.



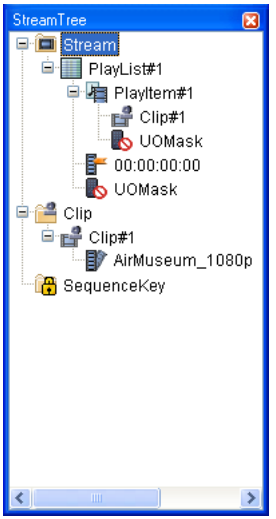
Scenarist BD creates the Clip, PlayList, and includes any associated items.

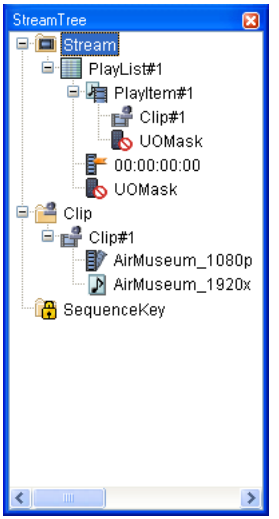
- Select one or more Video/Audio/IG/PG assets in the Data Tree (or Data Editor); then, right-click and choose Generate > PlayList from the shortcut menu.



Scenarist BD creates the Clip, PlayList, and includes any associated items.

2 To monitor the operation, expand the PlayList and Clip objects in the Stream Tree, so that all items are displayed.





In order for this automatic operation to succeed, a video asset must be one of the assets included in the operation. In addition:

- If you select multiple video assets, Scenarist BD creates one Clip/PlayList set for each video asset.
- If you select other assets (audio/IG/PG) along with a video asset, Scenarist BD includes all of them within the Clip/PlayList set.

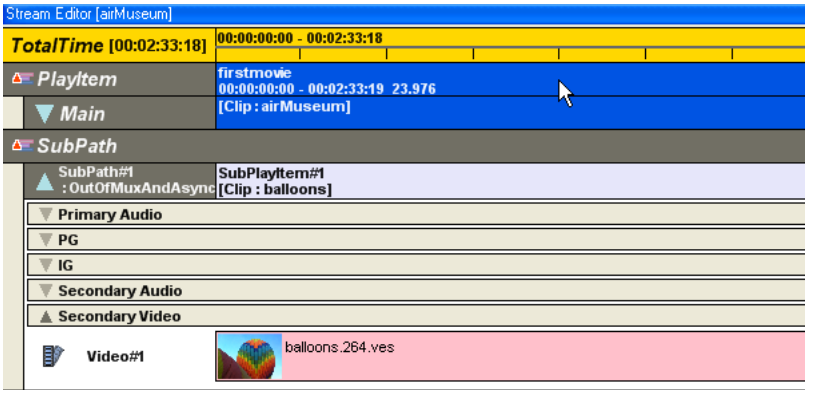
PlayList In/Out Settings

Scenarist BD allows you to set specific In and Out times for a PlayItem in a PlayList. This gives you the option of using different portions of the same video asset (associated with a Clip) in different PlayLists, without having to import each portion as a separate video asset.

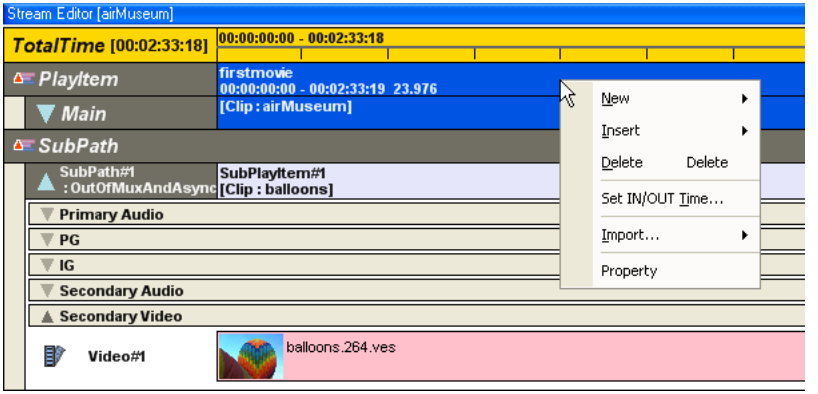
To set the In/Out time for a PlayList:

1. In the Stream Tree, double-click on the PlayList to display it in the Stream Editor.

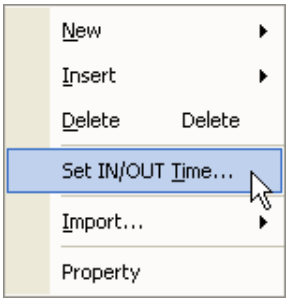
2. In the Stream Editor, right-click on the top PlayItem column (not the column that lists the Clip associated with the PlayItem).



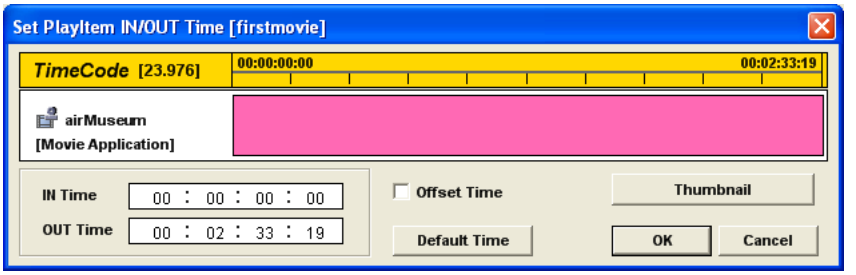
3. A shortcut menu appears.



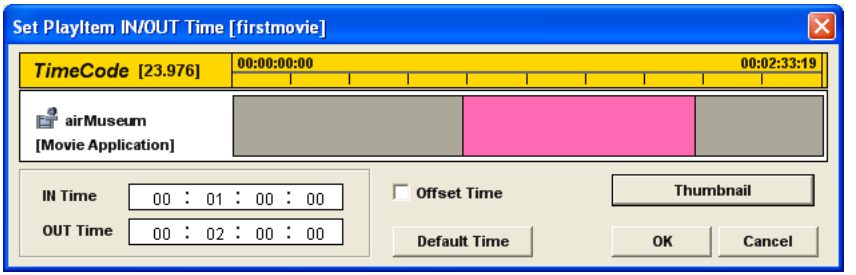
4 Select Set IN/OUT Time from the shortcut menu.



5 The Set PlayItem IN/OUT Time dialog box appears.



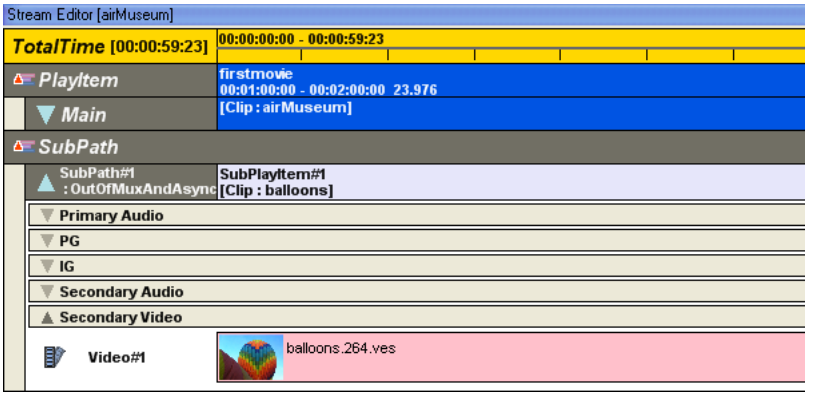
6 Type in time code for the desired IN Time and OUT Time. The dialog box shows the selected portion of the PlayItem in pink, relative to the total duration shown by the time line.



7 To see a thumbnail of the beginning of the selected IN Time, click Thumbnail. The Thumbnail dialog box appears.

8 Click Close to dismiss the Thumbnail dialog.

9 When you are finished setting your In/Out time for the PlayList, click OK in the Set PlayItem IN/OUT Time dialog box. The In/Out times you have chosen appear in the PlayItem row of the Stream Editor.



PlayListMarks

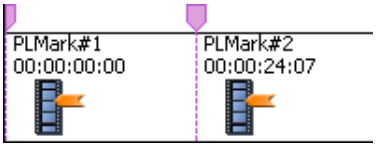
PlayListMarks (or chapters), which point to specific scenes in the Clips, can be added to PlayLists. PlayListMarks provide a convenient way for viewers to jump to the next or previous scene with the remote control. PlayListMarks can also serve as link destinations when jumping to the material from other titles or the Top Menu. This section includes the following topics:

- "PlayListMark thumbnail images" on page 151
- "PlayListMarks and entry points" on page 152
- "Inserting PlayListMarks" on page 152
- "Editing PlayListMark locations" on page 155
- "Deleting PlayListMarks" on page 156
- "Importing PlayListMarks" on page 157

PlayListMark thumbnail images

The Stream Editor has a toolbar button that allows you to turn PlayListMark (chapter) thumbnail images On or Off:

When you first open Scenarist BD, this feature is set to Off. Instead of thumbnail images, the Chapter track uses icons to represent the PlayListMarks:



In order to see the PlayListMark thumbnail images, you need to click the thumbnail images toolbar button to turn thumbnail images On. When thumbnail images are set to On, the toolbar button appears as follows:

PlayListMarks and entry points

PlayListMarks can be inserted at any point in a video stream. However, for maximum player compatibility and most reliable playback, it is advisable to tie PlayListMarks to specific scene locations, I Frames, which reside at the beginning of each group of pictures in the stream (the entry point) and contain the necessary information to display the entire frame. Scenarist BD allows for both methods of inserting PlayListMarks, either at any point in the video stream or snapped to the nearest I Frame in the video stream.

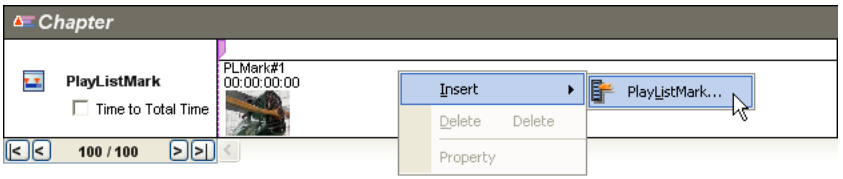
Inserting PlayListMarks

PlayListMarks are displayed and inserted in the Chapter track in the Stream Editor. PlayLists contain one chapter point (PLMark#1) by default that represents the beginning of the PlayList.

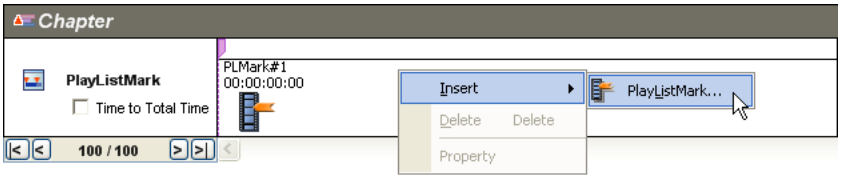
To insert a PlayListMark:

1 In the Stream Tree, select the PlayList to which you will add the PlayListMark.

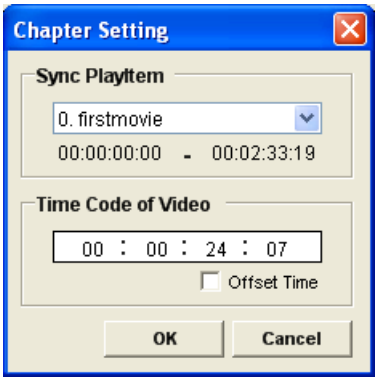
2 In the Stream Editor, right-click in the Chapter track and choose Insert > PlayListMark from the shortcut menu.



Note: If you have thumbnail images set to Off, the Chapter track will appear as follows:



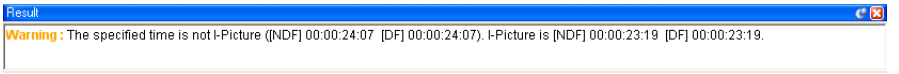
The Chapter Setting dialog box appears.



3 If appropriate, fine-tune the location of the PlayListMark by editing the value in the Time Code of Video field.

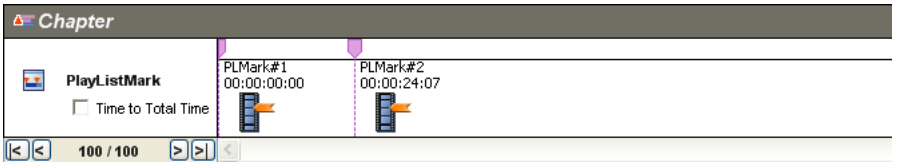
4 Click OK. A PlayListMark is inserted in the Chapter track and is automatically numbered based on its position within the track. The PlayListMark displays its location and thumbnail.

Note: If the location you have selected is not an I Frame, the Result tab of the Log window displays a warning message.



This message includes the time code of the nearest I Frame, which allows you to edit the location of the PlayListMark so as to tie it to an I Frame. For details, see “Editing PlayListMark locations,” below.

Note: If you have thumbnail images set to Off, the Chapter track will appear as follows:



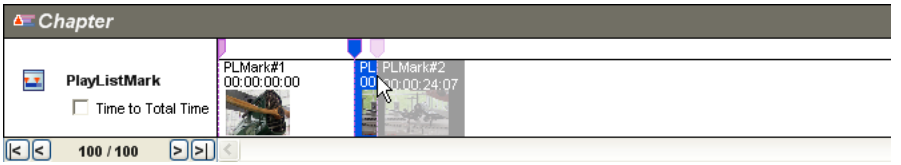
5 To rename the PlayListMark, select it in the Chapter track, and enter a new name in the Name field in the Properties window.

Editing PlayListMark locations

PlayListMarks can be moved by dragging them in the Chapter track in the Stream Editor, or by entering a new location in the Property window. The first PlayListMarks point (PLMark#1) cannot be moved.

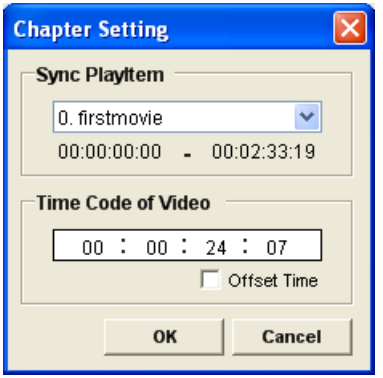
To change the position of a PlayListMark, do one of the following:

- In the Chapter track in the Stream Editor, drag the PlayListMark left or right within the track.



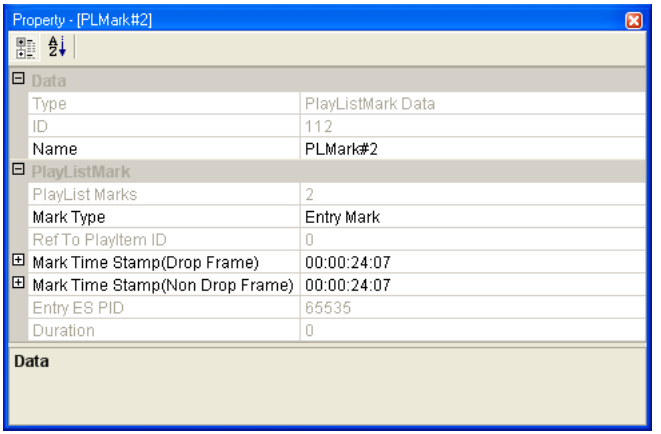
When prompted with the Chapter Setting dialog box, verify the new location.

- Double-click on the PlayListMark thumbnail. The Chapter Setting dialog box appears.



Enter a new location in the Time Code of Video field; then click OK.

- Select the PlayListMark, either in the Stream Tree or in the Chapter track in the Stream Editor, and enter a new location in the Mark Time Stamp field in the Property window.



Deleting PlayListMarks

To delete a PlayListMark, do one of the following:

- In the Stream Editor in the Chapter track, select the PlayListMark you want to delete and choose Edit > Delete, or press the Delete key.
- In the Stream Editor in the Chapter track, right-click the PlayListMark you want to delete, and choose Edit > Delete from the shortcut menu.

Note: The first PlayListMark (PLMark#1) cannot be deleted from a movie.

Importing PlayListMarks

Scenarist BD allows you to import PlayListMark (chapter) information in a variety of file formats, including CSV (comma-separated values), TSV (tab-delimited values) and VENC (Video Encoder). Scenarist BD uses the information in the file to set the PlayListMarks for a PlayItem.

CSV format

Comma-separated values (CSV) files are easy to create in Microsoft Excel, which has a "Save As CSV (Comma delimited) (*.csv)" function. For example:

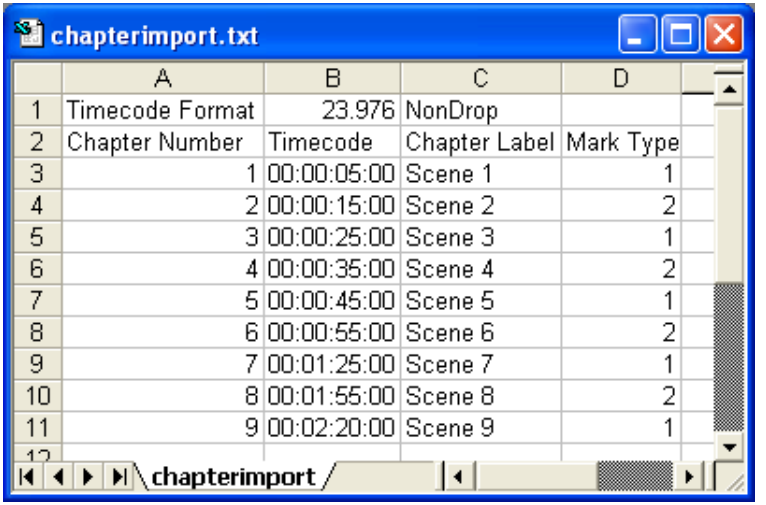
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	23.976	NonDrop	00:00:20:0	00:00:50:0	00:01:10:0	00:01:40:0	00:02:00:0	00:02:30:0	00:03:00:0	00:03:25:0	00:03:50:0	00:04:15:00	

When you use the Save As function, the application inserts commas between the information in each cell.

The first value in a chapter import CSV file is the FrameRate; possible values are 23.976, 24, 25, 29.97, 30, 50, 59.94, and 60. The second specifies either Drop or NonDrop frame. Each successive value is a PlayListMark, given in (hh:mm:ss:ff) time code format.

TSV format

Tab-separated values (TSV) files are easy to create in Microsoft Excel, which has a "Save As Text (tab delimited) (*.txt)" function. For example:



When you use the Save As function, the application inserts tabs between the information in each cell.

The first row of the file has the following entries:

- "Timecode format" (required).
- Frame rate (required); possible values are 23.976, 24, 25, 29.97, 30, 50, 59.94, and 60.
- Frame value (required); possible values are Drop and NonDrop.

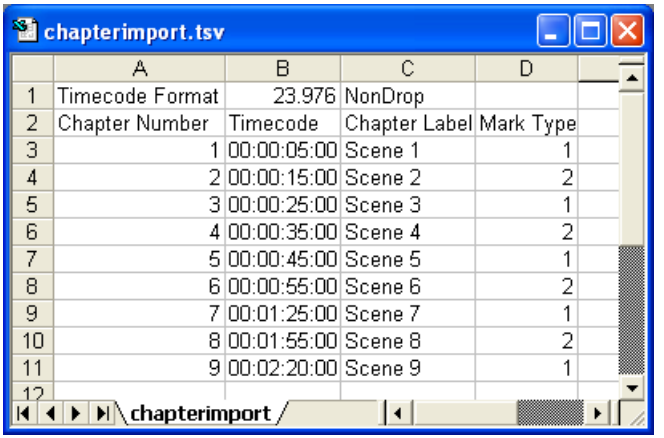
The second row of the file has the following column heading entries:

- "Chapter Number" (required).
- "Timecode" (required).
- "Chapter Label" (required).
- "Mark Type" (required).

The data rows that follow contain the chapter mark values, as follows:

- Chapter number (required).
- Time code value (required), given in (hh:mm:ss:ff) format.
- Chapter label value (optional), a text entry.
- Mark type (optional); possible values are 1 (Entry Mark) and 2 (Link Point).

Although the Excel Save As function lists ".txt" as the file extension, you can also use ".tsv" as the extension, to indicate the file format more exactly:



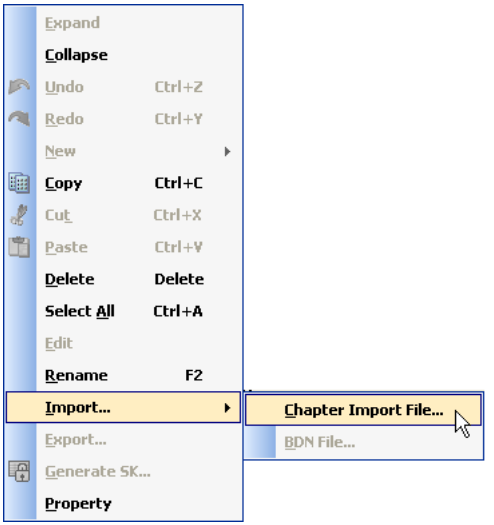
	A	B	C	D
1	Timecode Format	23.976	NonDrop	
2	Chapter Number	Timecode	Chapter Label	Mark Type
3	1	00:00:05:00	Scene 1	1
4	2	00:00:15:00	Scene 2	2
5	3	00:00:25:00	Scene 3	1
6	4	00:00:35:00	Scene 4	2
7	5	00:00:45:00	Scene 5	1
8	6	00:00:55:00	Scene 6	2
9	7	00:01:25:00	Scene 7	1
10	8	00:01:55:00	Scene 8	2
11	9	00:02:20:00	Scene 9	1
12				

VENC format

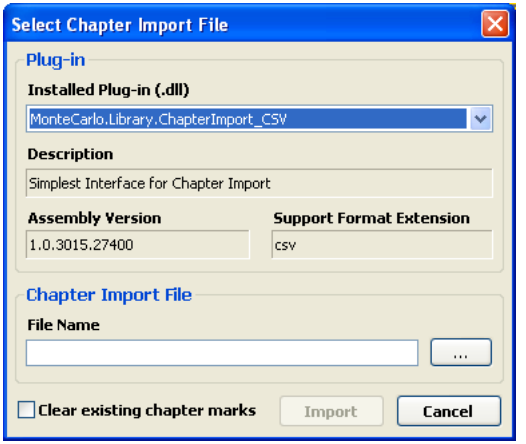
Video Encoder (VENC) files use .xml format, and follow the BAE-VM700 standard.

To import PlayListMark (chapter) information:

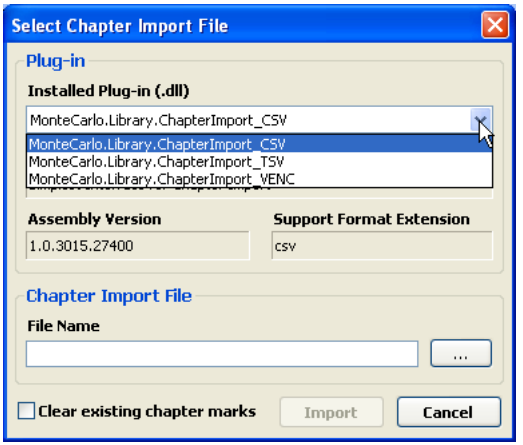
1 In the Stream Tree, right-click the PlayItem to which you will add the PlayListMark (chapter) information, and choose Import > Chapter Import File from the shortcut menu.



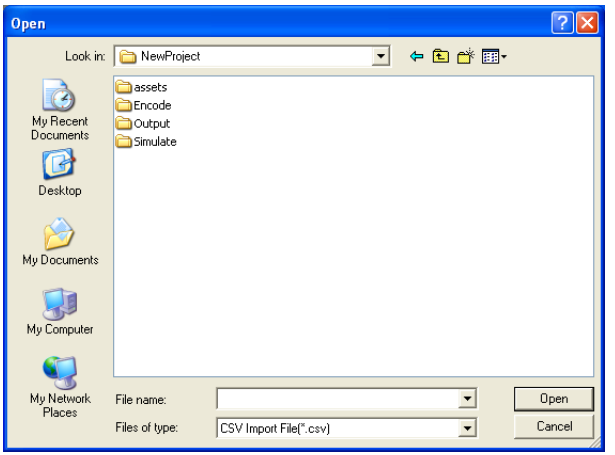
The Chapter Import File Select dialog box appears.



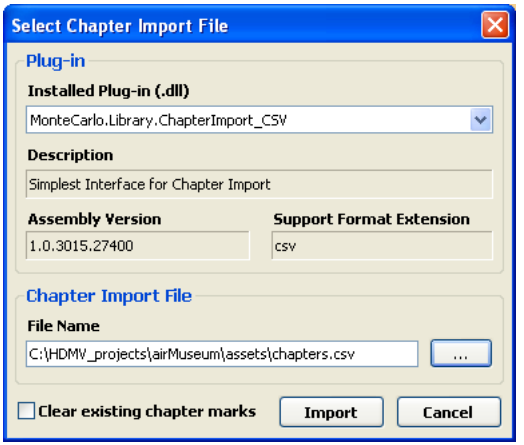
2 In the Installed Plug-in field, select the appropriate chapter import file using the drop-down list.



3 Click the Browse button next to the File Name field. The Open dialog box appears.

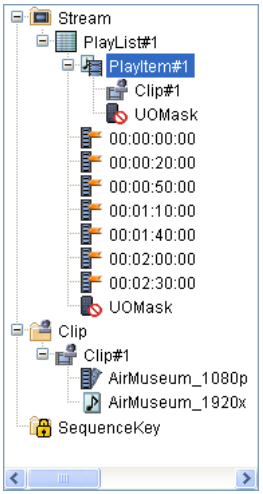


4 Locate and select the chapter import file you want to use; then click Open. The path to the file appears in the File Name field.

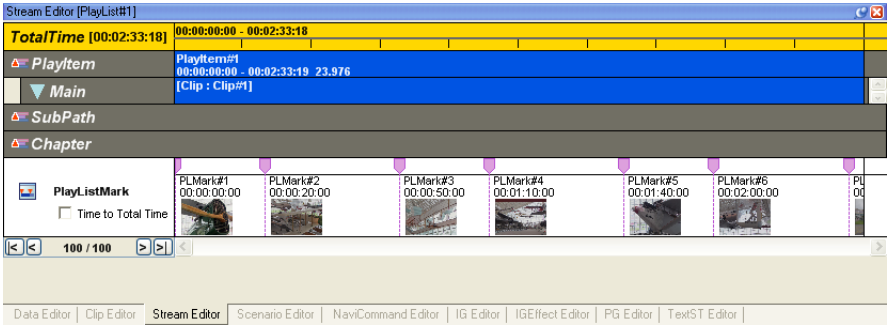


5 If appropriate, click the "Clear existing chapter marks" checkbox to select the option. If selected, any existing PlayListMarks are deleted when the Chapter Import File is imported. If not selected, PlayListMarks in the Chapter Import File are inserted along with the existing PlayListMarks (if they have new time code values), or replace existing PlayListMarks (if they have the same time code values).

6 Click Import. Scenarist BD imports the information in the file, and creates the PlayListMarks (chapters) specified by the file. The PlayListMarks appear in the Stream Tree.



The Stream Editor displays the location and a thumbnail (or a PlayListMark icon) for each PlayListMark.



Slideshow PlayLists

The BD format supports two types of slideshows: time-based slideshows, where each slide has a specified duration, and browsable slideshows, where each slide has an infinite duration. The following sections document how to create slideshow Clips and slideshow PlayLists:

- "Creating time-based slideshow Clips" on page 164
- "Creating browsable slideshow Clips" on page 166
- "Creating slideshow PlayLists" on page 168

Note: Slideshow images must be prepared in the Still Image Encoder (see "Using the Still Image Encoder" on page 35), and then processed with the MUI Generator ("Using the MUI Generator" on page 45), before they can be imported and used in Scenarist BD.

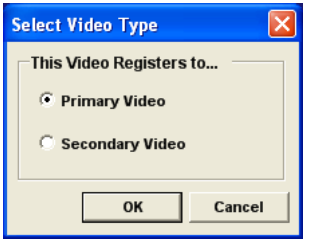
Creating time-based slideshow Clips

Slides for time-based slideshows have a specified duration, though they can still be navigated by the viewer, since each slide is a PlayListMark. However, since the audio stream is MUXed with the slideshow stream, navigating time-based slides causes an interruption to audio playback.

To create a time-based slideshow Clip:

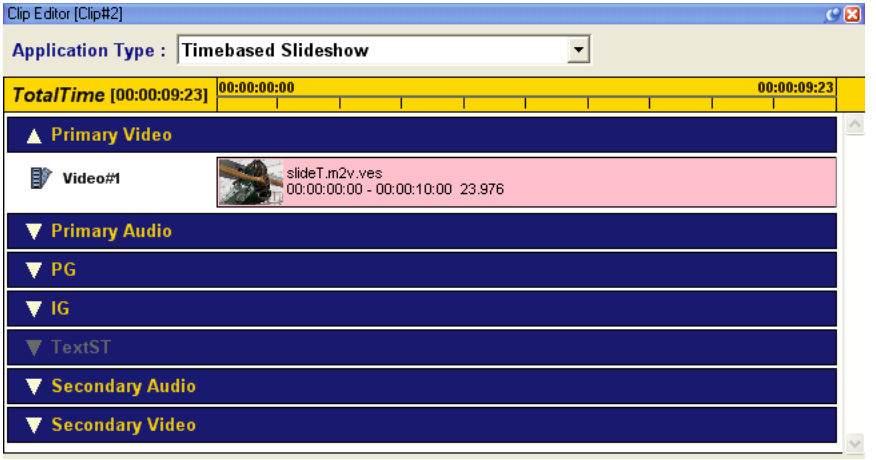
1. In the Stream Tree, right-click the Clip folder to which you will add the time-based slideshow Clip, and choose Edit > New > Clip > Time Based Slideshow from the shortcut menu.
2. To rename the Clip, in the Stream Tree, click its name twice so it becomes selected, enter the new name, and press Enter.
3. Double-click the Clip to display it in the Clip Editor.

4 Drag a slideshow asset from the Data Tree onto the video track in the Clip Editor. The Select Video Type dialog box appears.



5 Make sure that Primary Video is selected; then click OK.

6 The slideshow stream is added to the track and the asset's name, slide thumbnail (for the first slide), and start and end points are displayed in the track.



7 Drag an audio asset from the Data Tree onto the Primary Audio track in the Clip Editor. Audio is added to the track and the asset's name and start and end points are displayed in the track.

Note: For information on adding interactive graphics and presentation graphics to slideshow Clips, see Chapter 10, "Interactive graphics," and Chapter 12, "Presentation graphics."

Creating browsable slideshow Clips

Slides for browsable slideshows have an infinite duration, allowing the viewer to navigate the slides as they see fit, without interrupting audio playback. This is possible by creating an out-of-MUX audio Clip that plays back independently of the slideshow stream (see "Creating audio Clips for browsable slideshows" on page 167).

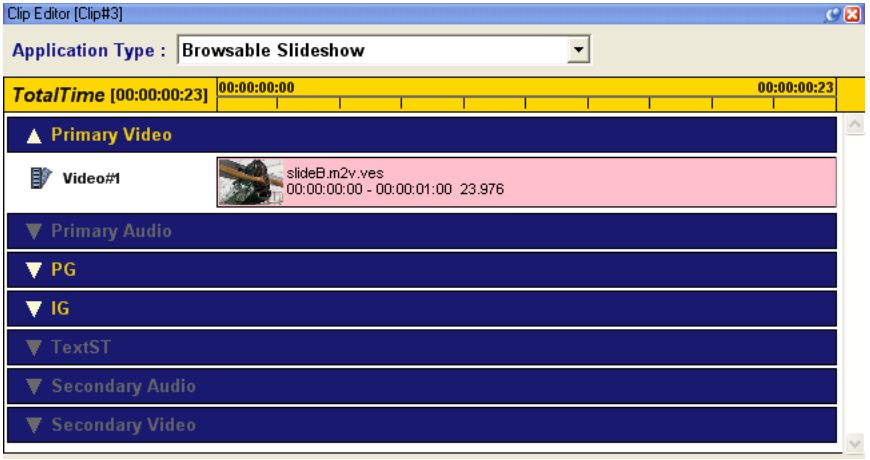
To create a browsable slideshow Clip:

1 In the Stream Tree, right-click the Clip folder to which you will add the browsable slideshow Clip, and choose Edit > New > Clip > Browsable Slideshow from the shortcut menu.

2 To rename the Clip, in the Stream Tree, click its name twice so it becomes selected, enter the new name, and press Enter.

3 Double-click the Clip to display it in the Clip Editor.

4 Drag a browsable slideshow asset from the Data Tree onto the video track in the Clip Editor. The slideshow stream is added to the track and the asset's name, slide thumbnail (for the first slide), and start and end points are displayed in the track.



Note: For information on adding interactive graphics and presentation graphics to slideshow Clips, see Chapter 10, "Interactive graphics," and Chapter 12, "Presentation graphics."

Creating audio Clips for browsable slideshows

Unlike Clips for time-based slideshows, Clips for browsable slideshows do not contain a Primary Audio track. Instead, a separate Clip must be prepared that contains the audio. When assembling the PlayList for the browsable slideshow, both the slideshow Clip and the audio Clip must dragged into the Stream Editor.

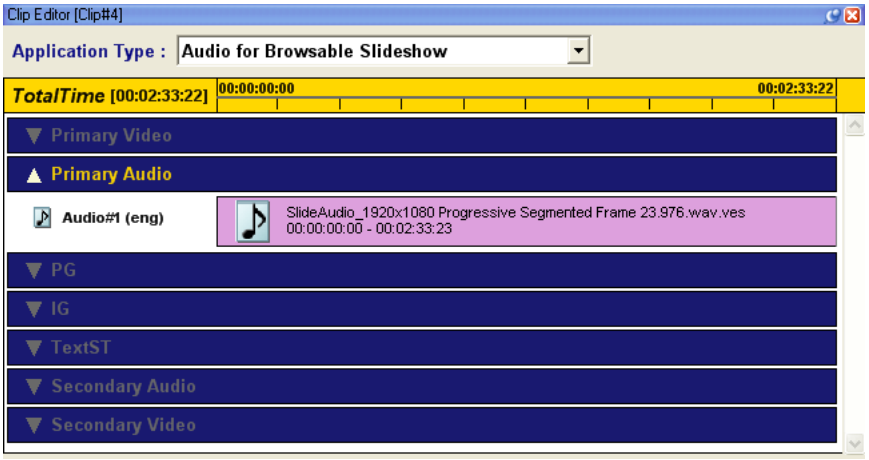
To create an audio Clip for a browsable slideshow:

1 In the Stream Tree, right-click the Clip folder to which you will add the audio Clip, and choose Edit > New > Clip > Audio for Browsable Slideshow from the shortcut menu. A new Clip is added to the folder.

2 To rename the Clip, in the Stream Tree, click its name twice so it becomes selected, enter the new name, and press Enter.

3 Double-click the Clip to display it in the Clip Editor.

4 Drag an audio asset from the Data Tree onto the Primary Audio track in the Clip Editor. Audio is added to the track and the audio asset's name and start and end points are displayed in the track.



Creating slideshow PlayLists

Much like movie PlayLists, slideshow PlayLists are created by dragging Clips from the Stream Tree into the Stream Editor.

To create a slideshow PlayList:

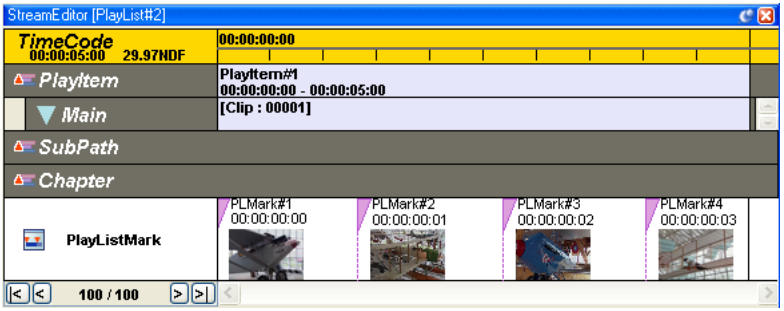
1 In the Stream Tree, right-click the stream folder to which you will add the PlayList, and choose Edit > New > PlayList from the shortcut menu. A new PlayList is added to the folder.

2 To rename the PlayList, in the Stream Tree, click its name twice so it becomes selected, enter the new name, and press Enter.

3 Select the PlayList and choose Edit > New > PlayItem. A PlayItem is added to the PlayList.

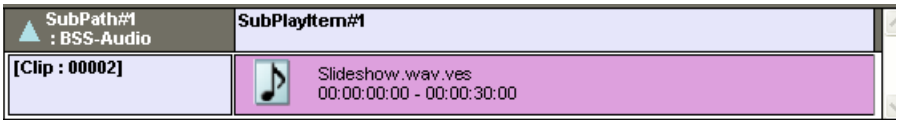
4 Double-click the PlayList to display it in the Stream Editor. A blank Clip is displayed in the PlayItem track.

5 Drag a slideshow Clip from the Stream Tree onto the blank Clip in the PlayItem track in the Stream Editor. The Clip is added to the PlayItem, and the slides are displayed in the Chapter track with thumbnails and locations.



6 If you are creating a PlayList for a browsable slideshow and want to add audio to the sub-path, do the following:

- Select the PlayList in the Stream Tree and choose Edit > New > SubPath > Primary Audio for Browsable Slideshow.
- Drag a browsable slideshow audio Clip from the Stream Tree onto the SubPath. Audio is added to the SubPath and the asset's name and start and end points are displayed in the track.



PlayLists with multiple PlayItems

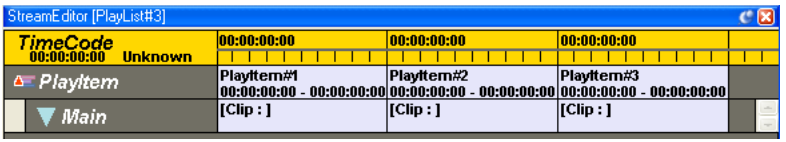
PlayLists can contain multiple PlayItems, allowing the flexibility of playing numerous Clips in succession, or even randomly. Each PlayItem can represent all the scenes in a movie, or they could represent different television episodes on a disc compilation. This section includes the following topics:

- "Creating Playlists with multiple PlayItems" on page 170
- "Random and shuffle playback" on page 171

Creating Playlists with multiple PlayItems

To create a PlayList with multiple PlayItems:

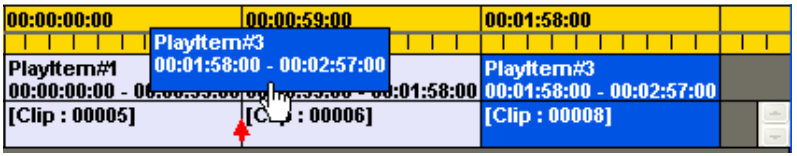
1. In the Stream Tree, right-click the stream folder to which you will add the PlayList, and choose Edit > New > PlayList from the shortcut menu. A new PlayList is added to the folder.
2. To rename the PlayList, in the Stream Tree, click its name twice so it becomes selected, enter the new name, and press Enter.
3. Right-click the PlayList, and choose Edit > New > PlayItem from the shortcut menu. A PlayItem is added to the PlayList. Repeat this step to add additional PlayItems.



Note: To insert a PlayItem, right-click a PlayItem in the Stream Editor and choose Insert > PlayItem from the shortcut menu. The new PlayItem is inserted before the right-clicked PlayItem.

4. Drag Clips from the Stream Tree onto each PlayItem in the Stream Editor.
5. To re-order PlayItems in the PlayList, do one of the following:

- In the Stream Tree, expand the PlayList so its PlayItems are displayed. Drag a PlayItem up or down within the list to change its playback position.
- In the Stream Editor, select a PlayItem and drag it left or right within the PlayItem track to change its playback position. As you drag, a Red arrow appears where the PlayItem will be placed you release the mouse button.

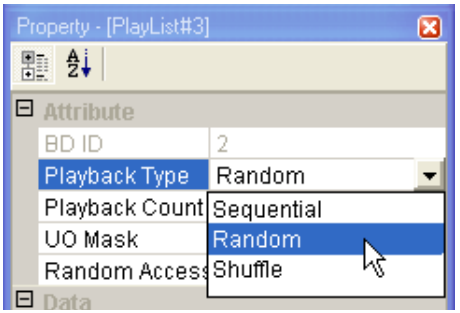


Random and shuffle playback

The Playback Type determines how a PlayList will play back: sequentially, randomly, or with shuffle.

To set the Playback Type for a PlayList:

1. In the Stream Tree, select the PlayList for which you set the Playback Type.
2. In the Property window, select the Playback Type using the drop-down list:



Sequential PlayItems are played sequentially in the order in which they reside within the PlayList.

Random PlayItems are played in a random order as generated by the player during playback.

Shuffle PlayItems are played in a random order as generated by the player during playback, but with no PlayItem being repeated until each PlayItem has been played.

3 Set the Random Access field to Prohibited.

Masking user operations

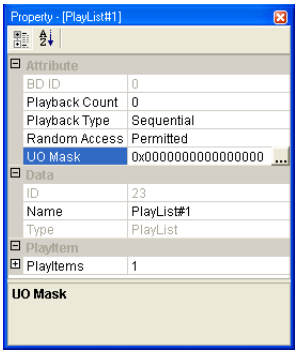
You can restrict which user operations are available for PlayLists and PlayItems. For example, you could restrict access to other titles once a title begins playing, or you could restrict FAST FORWARD or access to the TOP MENU during an intro movie. All user operations default to being enabled (permitted).

Note: The UO Mask settings for a PlayList override those of any PlayItems it contains.

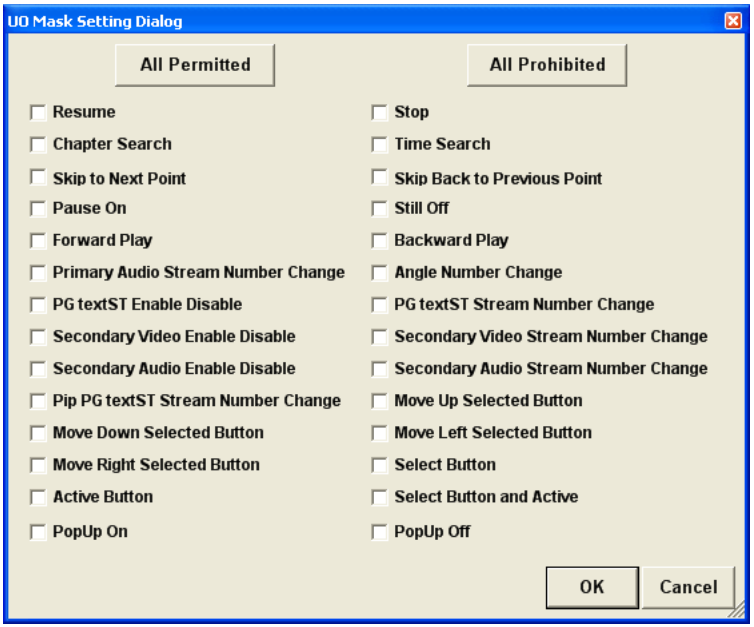
To mask user operations for a PlayList or PlayItem:

1 In the Stream Tree, select the PlayList or PlayItem for which will mask user operations.

2 In the Property window, click the Browse button next to the UO Mask field.



3 In the UO Mask Setting dialog box, specify which user operations will be permitted for the PlayList or PlayItem:



- Select user operations you want to prohibit (checked items will not be available to the user).
- To prohibit all user operations, click All Prohibited.
- To permit all user operations, click All Permitted.

4 Click OK to close the UO Mask Setting dialog box.

Note: In the Stream Tree, you can copy UO Mask objects between PlayLists and PlayItems, thereby allowing you easily to re-use common UO Mask settings throughout a project.

9 Picture-in-Picture effects

This chapter tells you how to create Picture-in-Picture effects using the Scenarist BD Picture-in-Picture editor. It includes the following topics:

- "Creating Picture-in-Picture Clips and PlayLists" on page 176
- "Launching the Picture-in-Picture editor" on page 182
- "Using the Picture-in-Picture Editor" on page 183
- "Importing PiP EDL files" on page 203

Creating Picture-in-Picture Clips and PlayLists

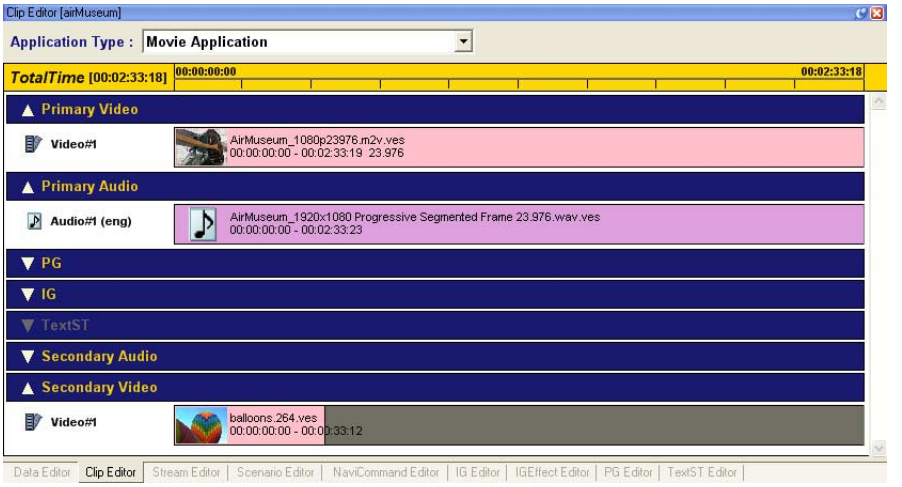
There are two basic ways of setting up Clips and PlayLists to accommodate Picture-in-Picture effects.; one involves using one Clip, and the other involves using two Clips. Each of these methods is described below.

Note: For detailed information on how to create Clips and PlayLists, see “Movie Clips and PlayLists” on page 140.

Picture-in-Picture with one Clip

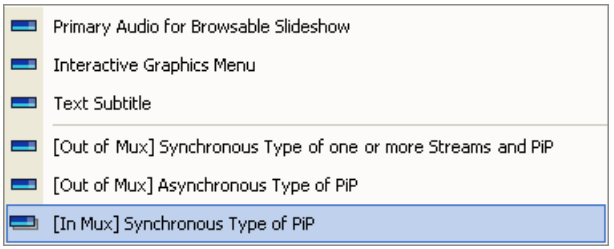
To create a Picture-in-Picture effect using one Clip:

1. Create a Movie Clip.
2. Add your primary video asset to the Clip’s Primary Video track, and add your Picture-in-Picture video asset to the Clip’s Secondary Video track.

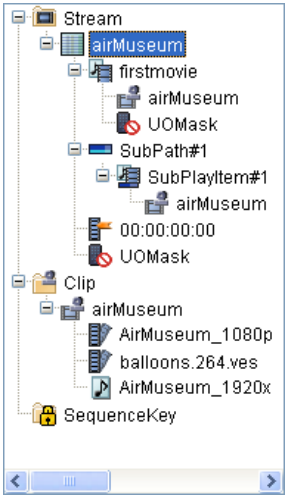


3. Create a Playlist, and add a PlayItem to it.

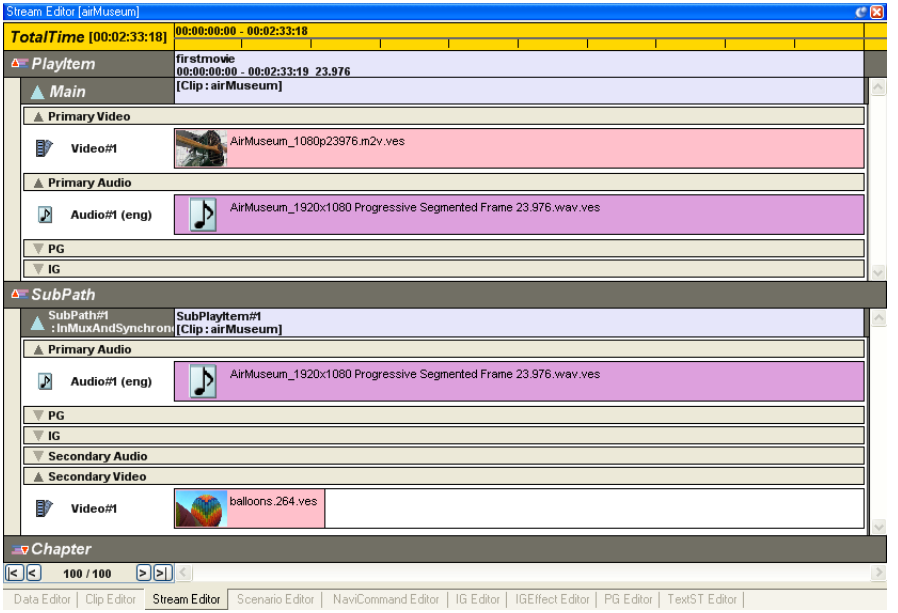
4 Add a SubPath to the PlayList; choose "[In Mux] Synchronous Type of PiP" as the type of SubPath.



5 Add the Clip to both the PlayItem and the SubPath.



6 Select the Stream Editor to view your PlayItem and SubPath.

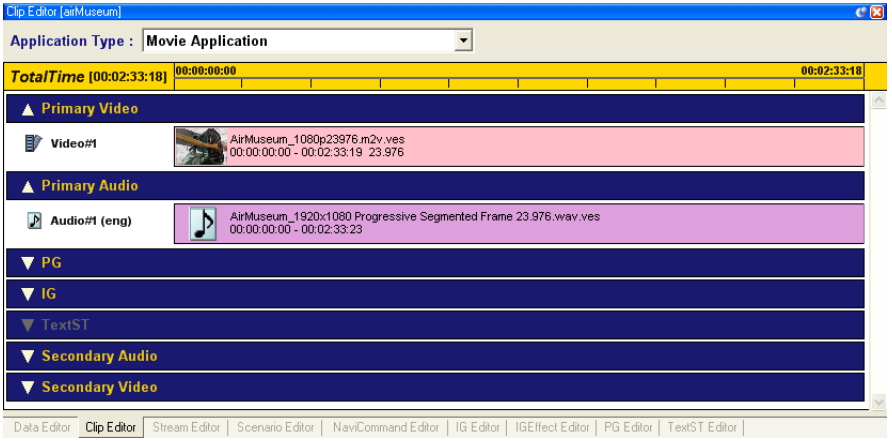


Picture-in-Picture with two Clips

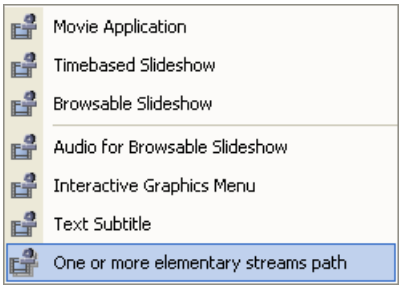
To create a Picture-in-Picture effect using two Clips:

1 Create a Movie Clip.

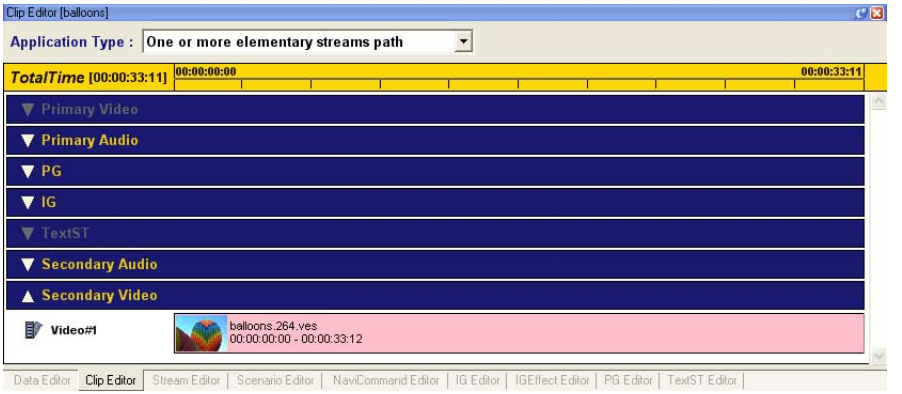
2 Add your primary video asset to the Clip's Primary Video track



3 Create a second Clip; choose the "One of more elementary streams path" option for this Clip.

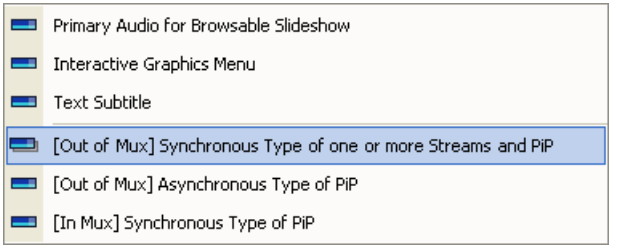


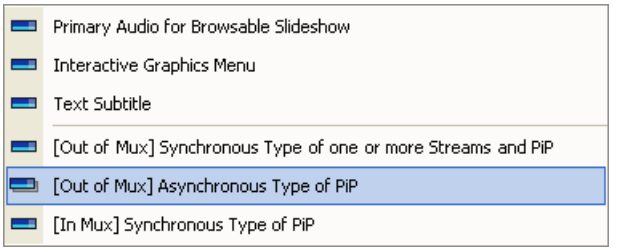
4 Add the picture-in-picture video asset to the second (“elementary stream”) Clip’s Secondary Video track.



5 Create a Playlist, and add a PlayItem to it.

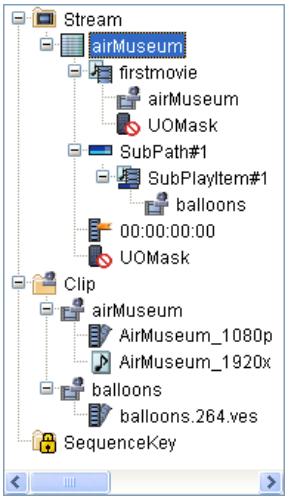
6 Add a SubPath to the PlayList; choose either “[Out of Mux] Synchronous Type of one or more streams and PiP” or “[Out of Mux] Asynchronous Type of PiP” as the type of SubPath.



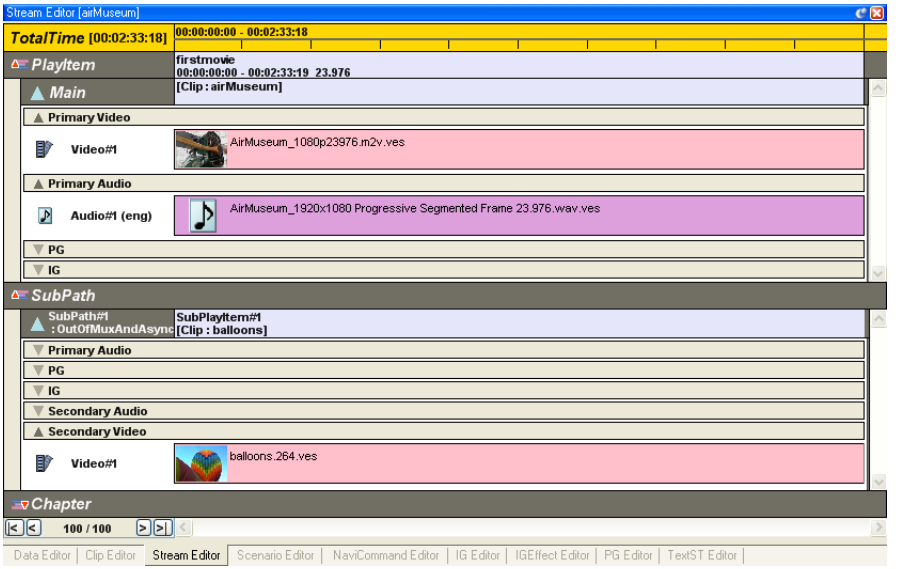


7 Add the Movie Clip to the PlayItem.

8 Add the Picture-in-Picture (“elementary stream”) Clip to the SubPath.



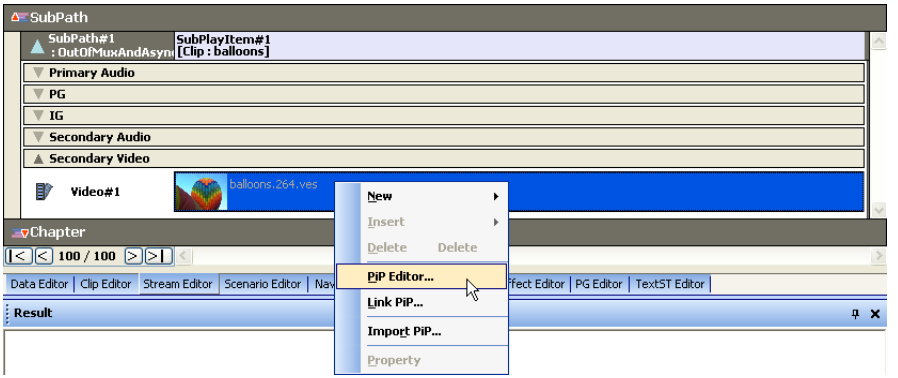
9 Select the Stream Editor to view your PlayItem and SubPath.



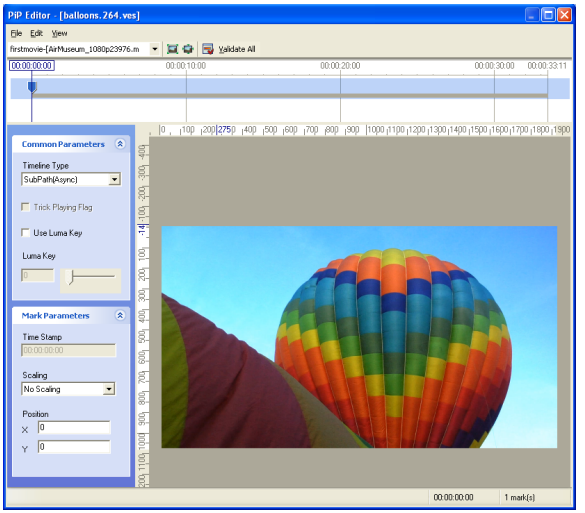
Launching the Picture-in-Picture editor

To launch the Picture-in-Picture editor:

1. Select the Stream Editor.
2. Right-click on the Picture-in-Picture video asset in the SubPath, then select PiP Editor from the shortcut menu.



The PiP Editor window appears.

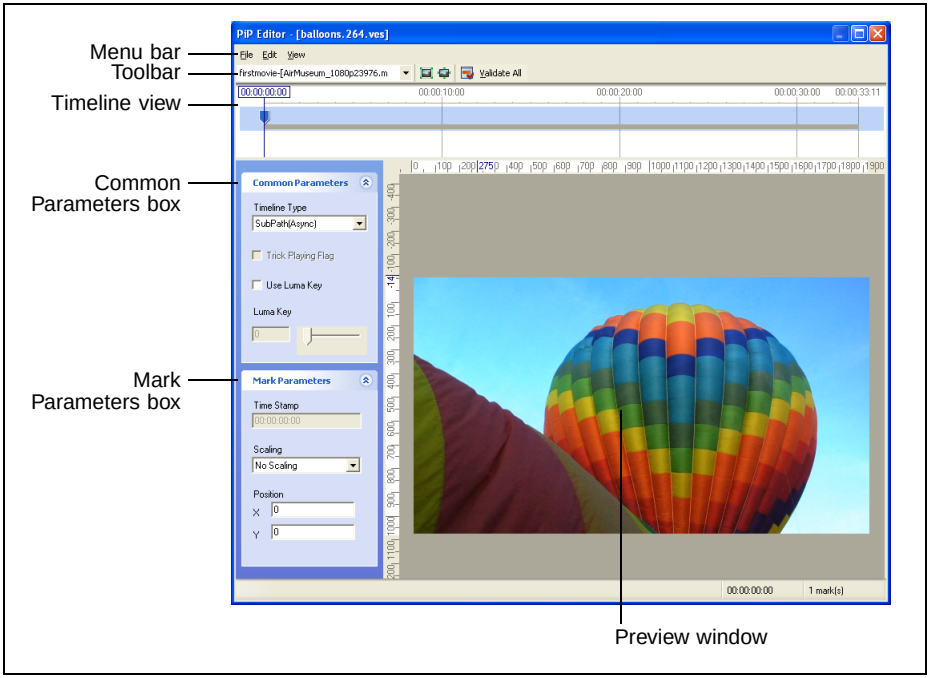


Using the Picture-in-Picture Editor

The Scenarist BD Picture-in-Picture Editor allows you to control the scaling, position, and opacity of your Picture-in-Picture effect. It also allows you to create a group of Marks along the Timeline, each of which can have its own scaling and positioning for your secondary (Picture-in-Picture) video.

PiP Editor Window

The PiP Editor window has a number of areas and features:

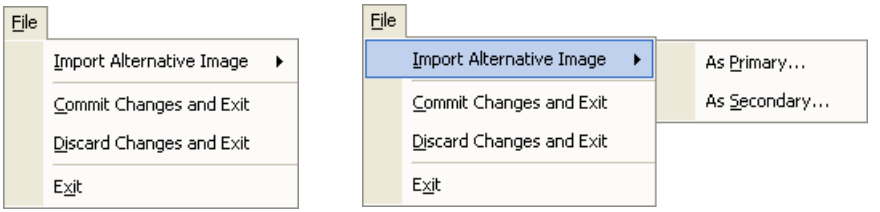


The Picture-in-Picture Editor

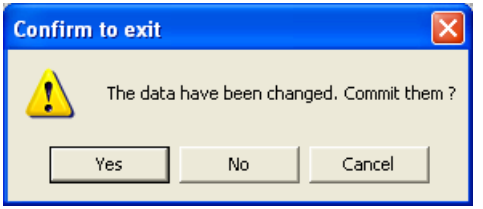
Menu bar

The Menu bar offers three menus: File menu, Edit menu, and View menu.

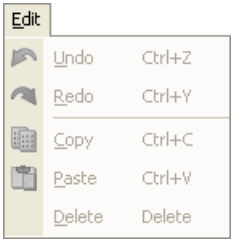
File menu



The File menu allows you to Import Alternative Images for both the Primary and Secondary (Picture-in-Picture) video. It also gives you the option to Commit Changes and Exit (save) or Discard Changes and Exit the PiP Editor. If you select Exit after you have made changes, the Editor asks you to Commit or Discard those changes before exiting.

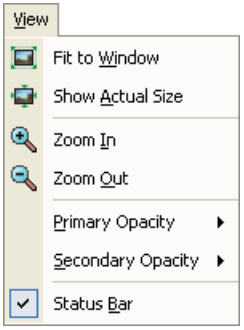


Edit menu

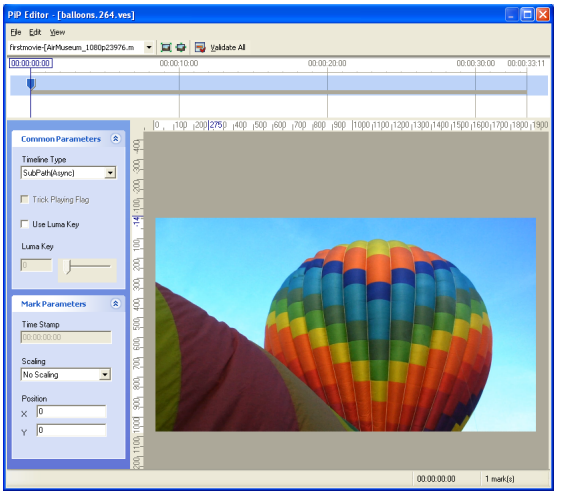


The Edit menu features a standard set of editing tools: Undo, Redo, Copy, Paste, and Delete.

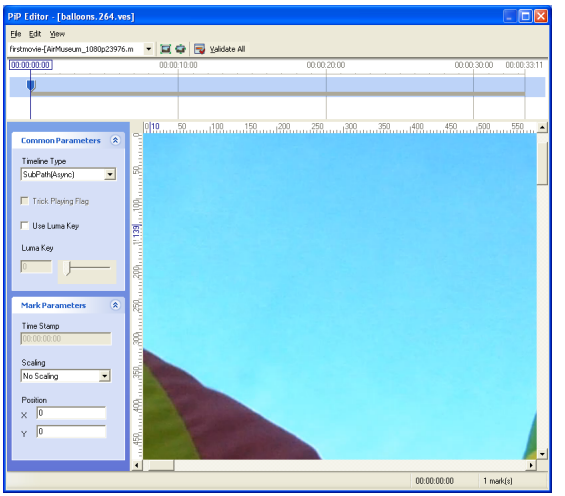
View menu



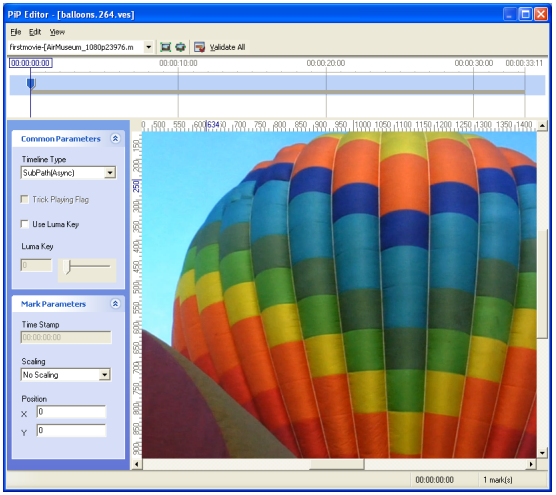
The View menu allows you to control the image in the Preview window. Fit to Window scales the video image inside the Preview window.



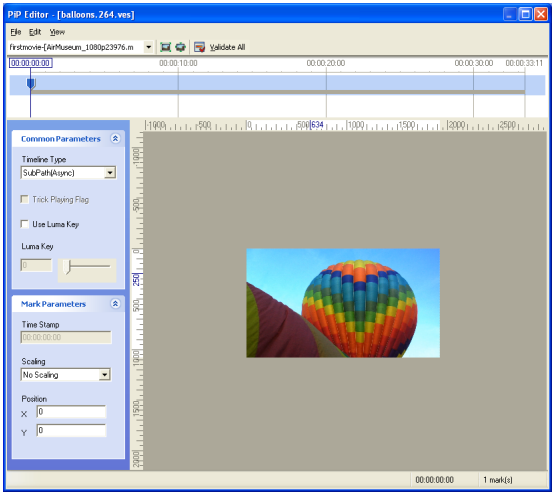
Show Actual Size shows the video image at full size.



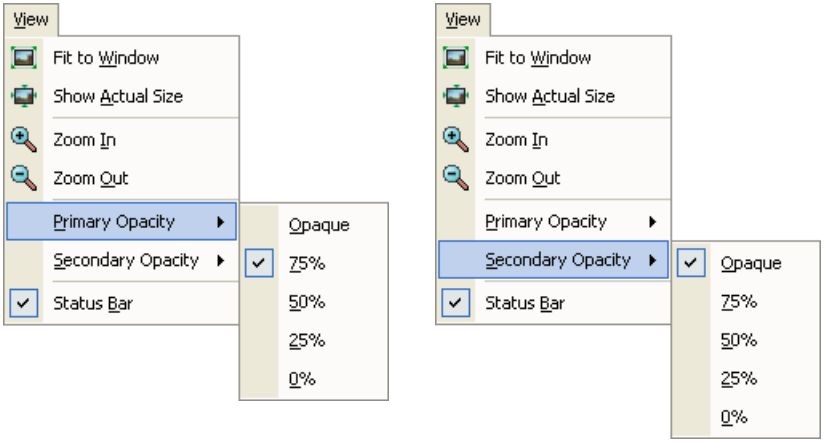
Zoom In increases the size of the video image.



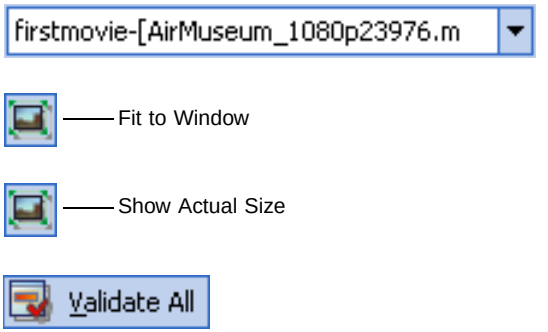
Zoom Out decreases the size of the video image.



In addition, the View menu allows you to set the Opacity of the Primary and Secondary video streams.



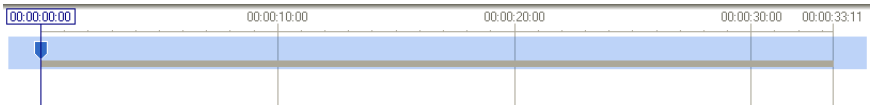
Toolbar



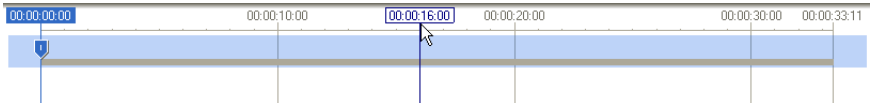
The field at the left lists the Primary Video asset. The Fit to Window and Show Actual Size buttons duplicate functions from the View menu. The Validate All button asks the PiP Editor to validate the settings you have created; once the Editor determines the validity of your setting, it shows a Success information box

Timeline view

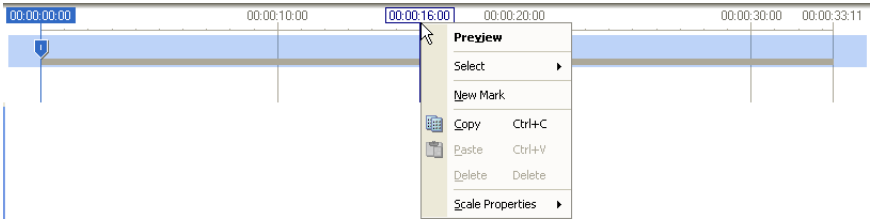
The Timeline view shows the timeline of your secondary video.



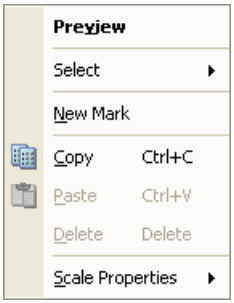
As you move the cursor through the Timeline view, it shows the time at the location of the cursor.

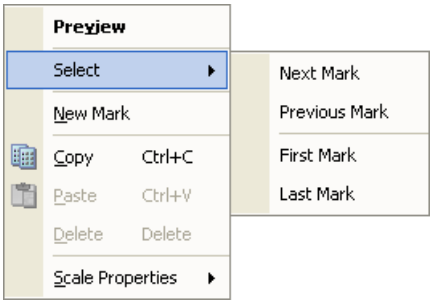


If you right-click while the cursor is in the Timeline view, the Timeline shortcut menu appears.

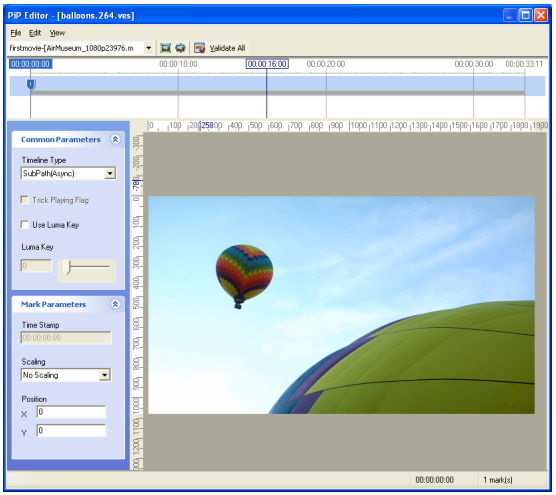


Timeline view shortcut menu

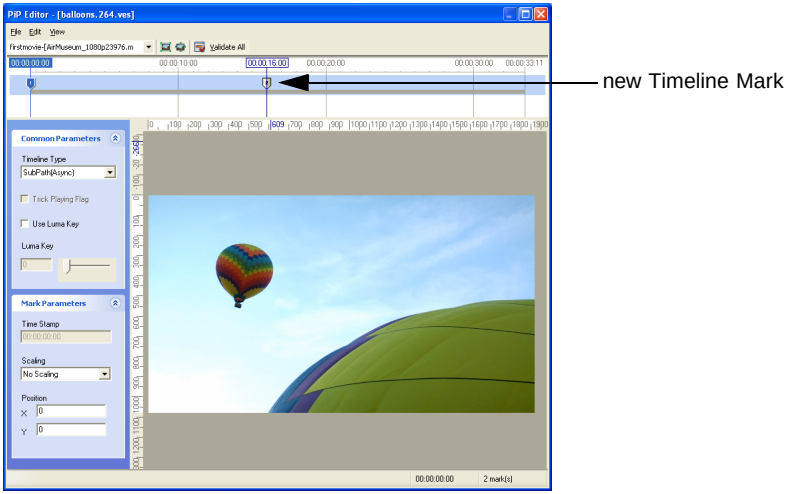




The Preview command lets you preview the video image at the selected time.

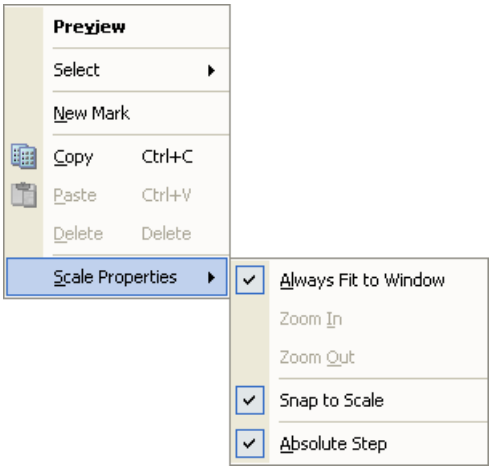


The Select command allows you to move back and forth through the Timeline Marks you have created. The New Mark command establishes a new Timeline Mark at the selected time.

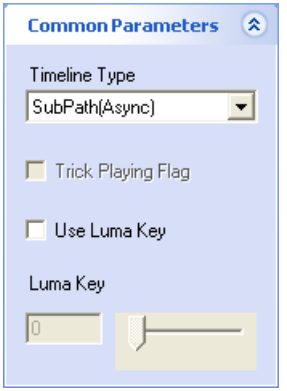


Note: For more information, see “Working with Timeline Marks” on page 199.

Copy, Paste, and Delete duplicate functions from the Edit menu. Scale Properties offers you a number of options for scaling in the Preview window

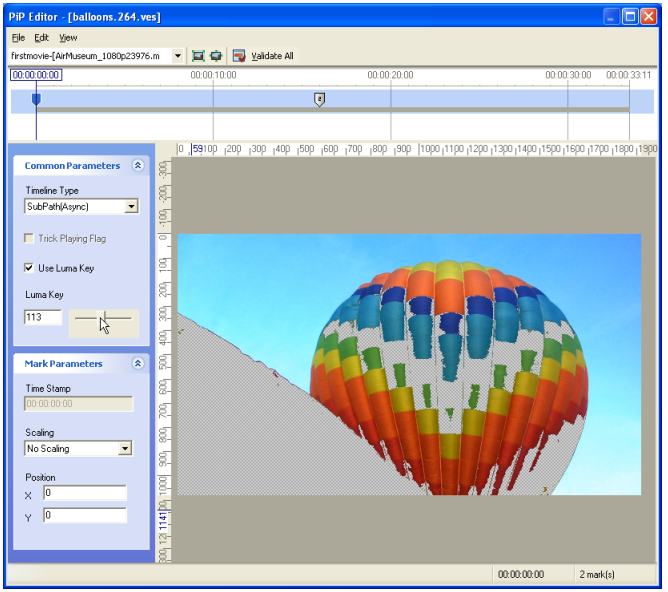


Common Parameters box

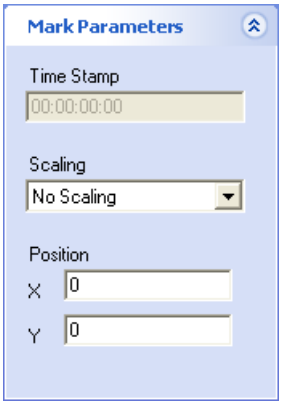


The Common Parameters box displays settings that are common to all secondary video in your SubPath, regardless of the TimeLine Mark that is displayed in the Preview Window

If you select the Use Luma Key option, the Luma Key slider allows you to set the overall brightness of the secondary video, in a range from 0 (brightest) to 255 (dimmest).



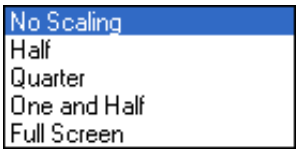
Mark Parameters box



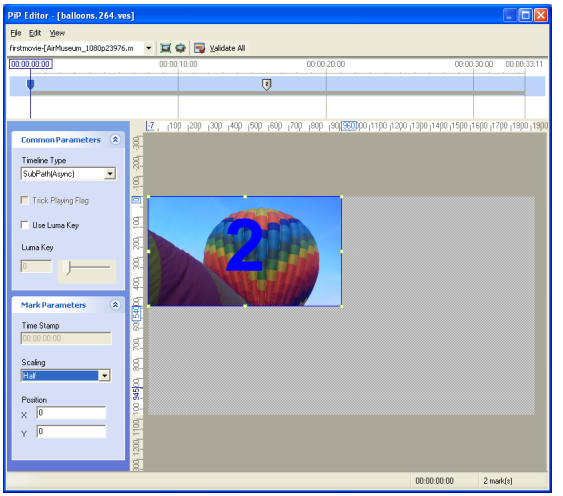
The Mark Parameters box displays specific settings for the Timeline Mark you have selected for display in the Preview window. The Time Stamp field shows the time selected for the Mark on the Timeline view. Location shows the position of the upper left corner of the Picture-in-Picture image along the X and Y axes.

Note: For more information, see “Working with Timeline Marks” on page 199.

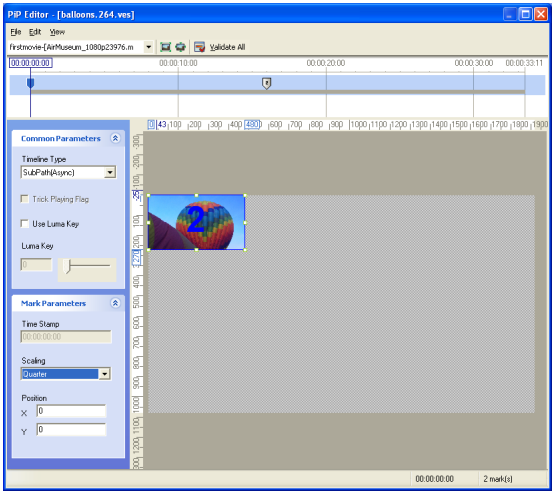
There are a number of options for Scaling of the secondary video image.



The selected scaling is applied to the picture-in-picture image in the Preview window. For example, Half scaling reduces each measurement of the video two one-half of its original value, creating an image that is 1/4 the original size:

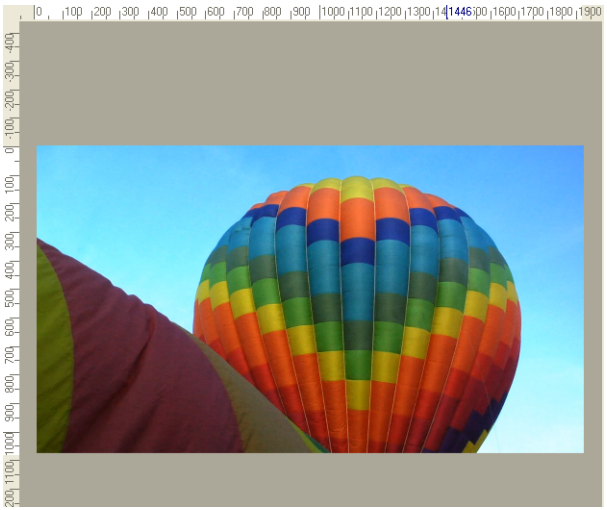


Quarter scaling reduces each measurement of the video two one-fourth of its original value, creating an image that is 1/16 the original size:



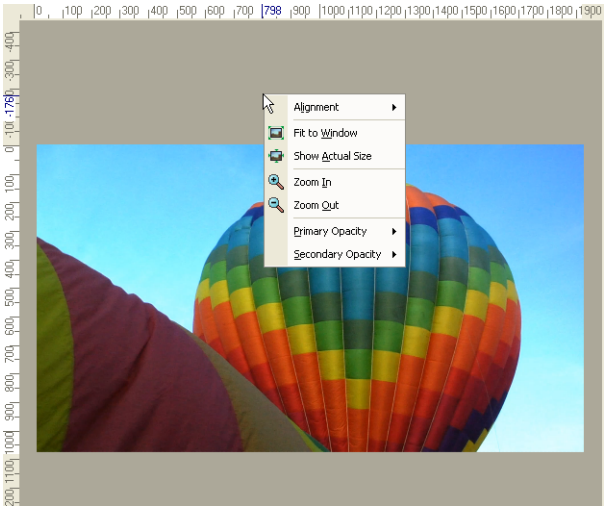
Preview Window

The Preview window shows the video image at the selected Timeline Mark.

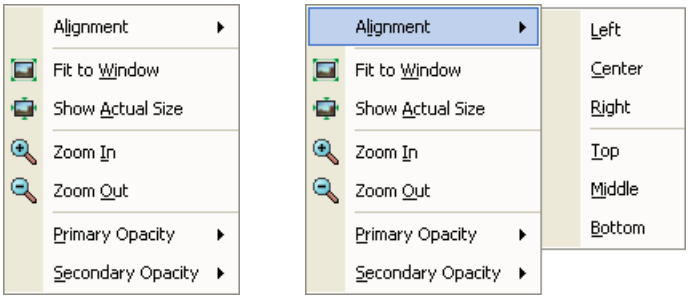


As you move the cursor through the Preview window, the location of the cursor (for both the X and Y axes) appears in blue along the rulers at the top and left.

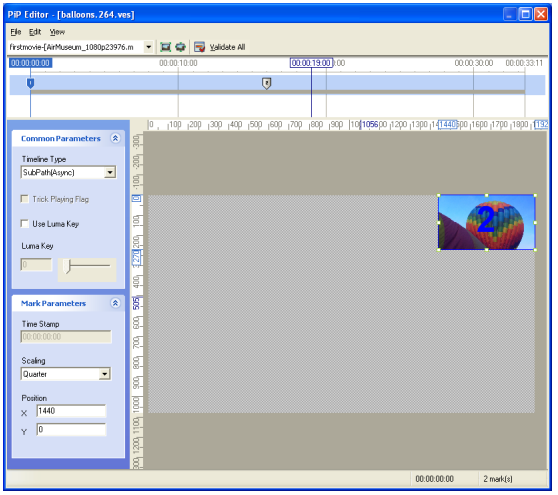
If you right-click while the cursor is in the Preview window, the Preview shortcut menu appears.



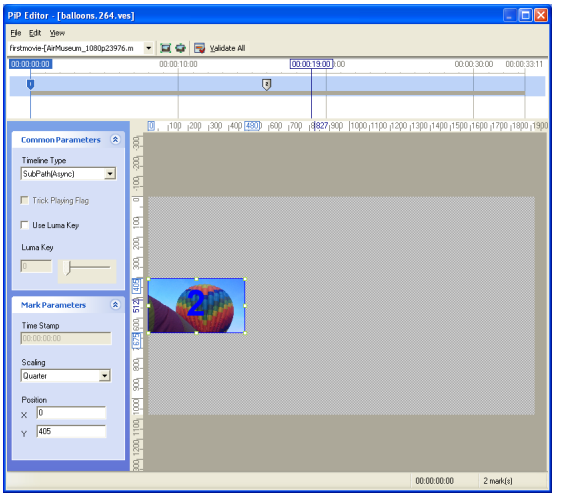
Preview shortcut menu



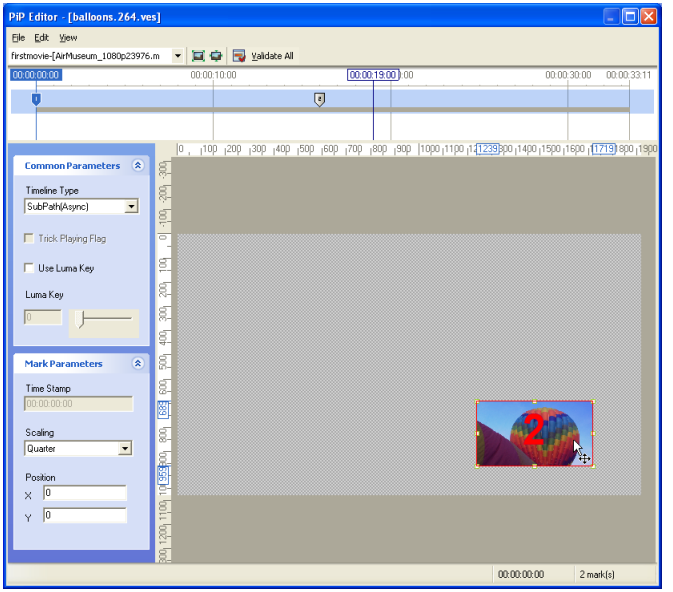
Alignment allows you to set a specific location for the video image, along the X axis (Left, Center, Right) and the Y axis (Top, Middle, Bottom). For example, a Quarter-scaled image set to Right and Top appears as follows:

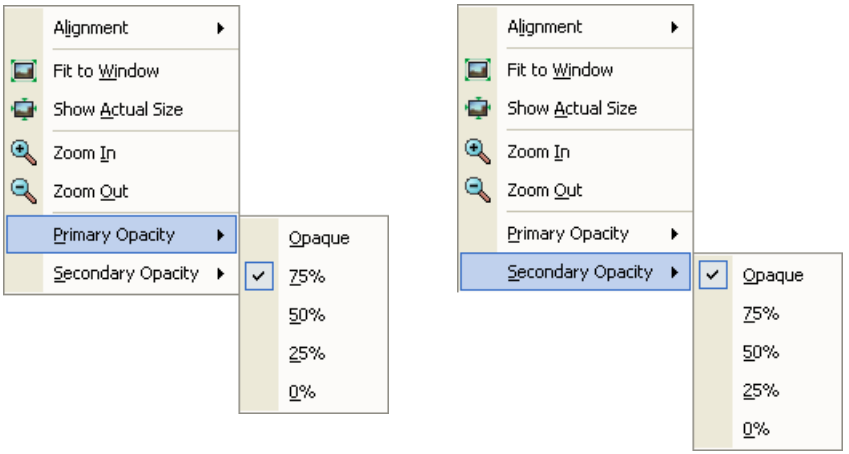


A Quarter-scaled image set to Left and Middle appears as follows:



You can also use the cursor to drag and drop the video image to any location.



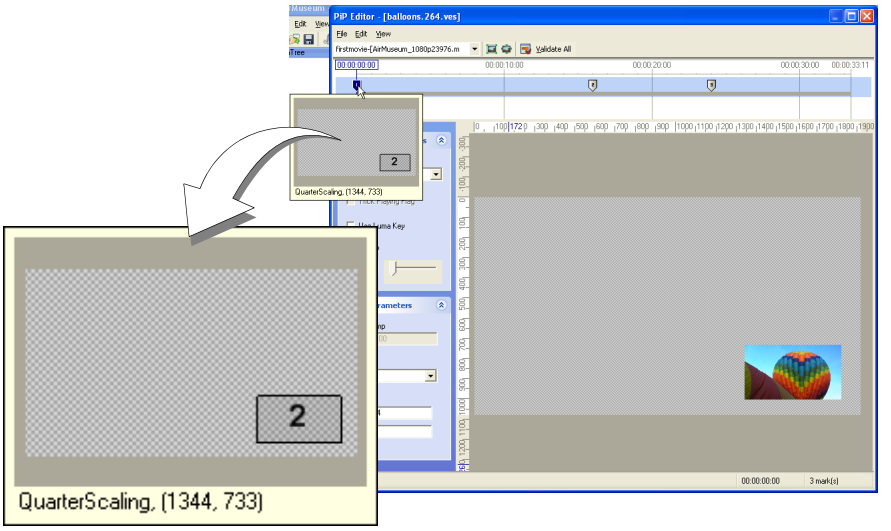


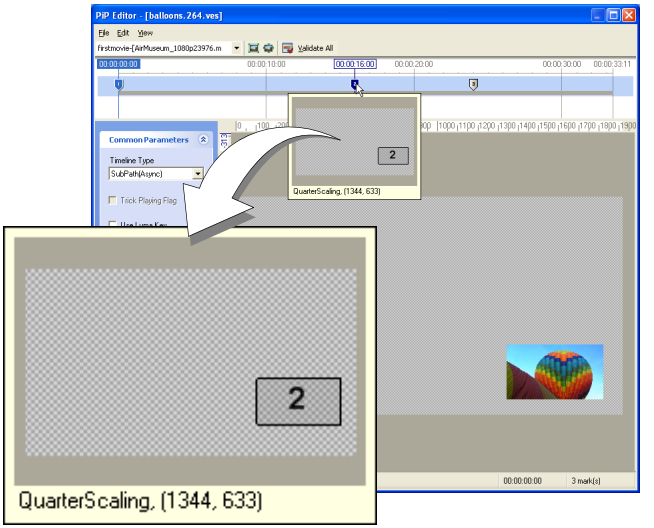
Fit to Window, Show Actual Size, Zoom In, Zoom Out, Primary Opacity, and Secondary Opacity duplicate functions from the View menu.

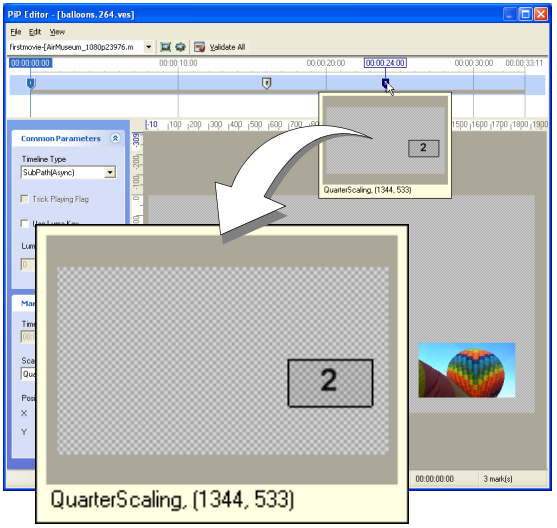
Working with Timeline Marks

Each individual Timeline Mark you create can have its own positioning and scaling for the secondary (picture-in-picture) video. Once you create a set of Timeline Marks, you can use the Timeline view to preview their values, or select one for viewing in the Preview window.

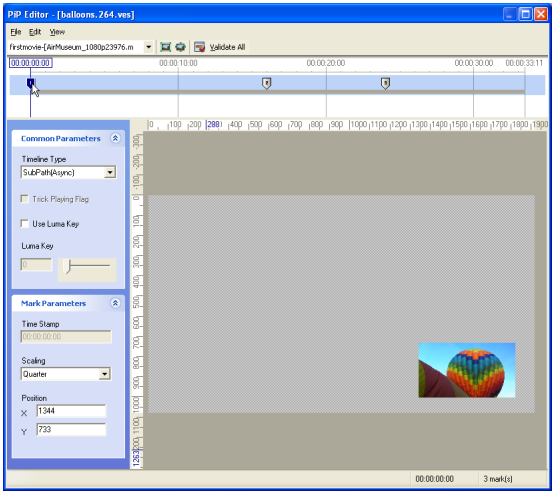
If you position your cursor over a Timeline Mark, a small preview pop-up appears, which shows the location and scaling values for that Mark.

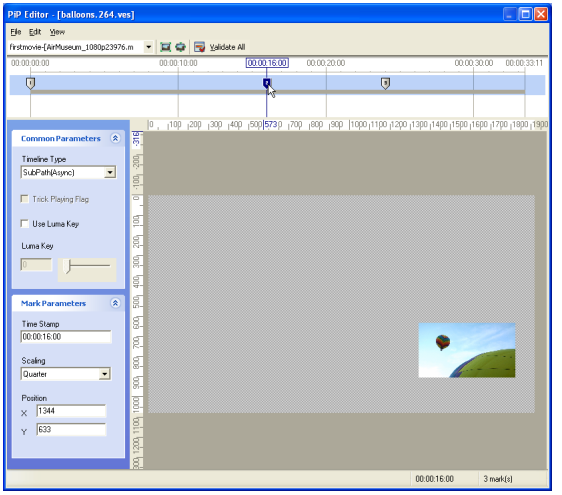


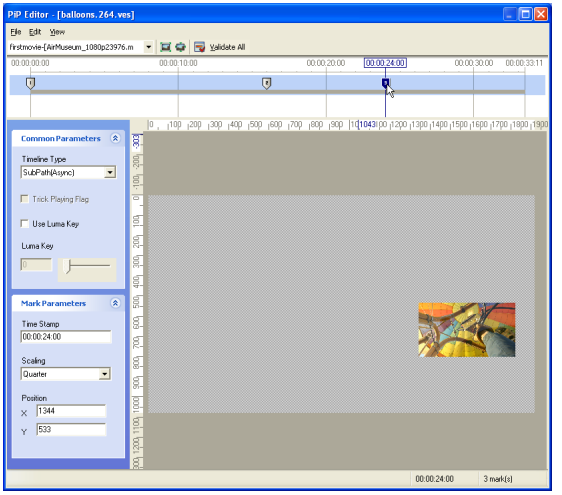




If you click on a particular Timeline Mark icon in the Timeline view, that Mark is selected for viewing in the Preview window, and its settings appear in the Mark Parameters box.

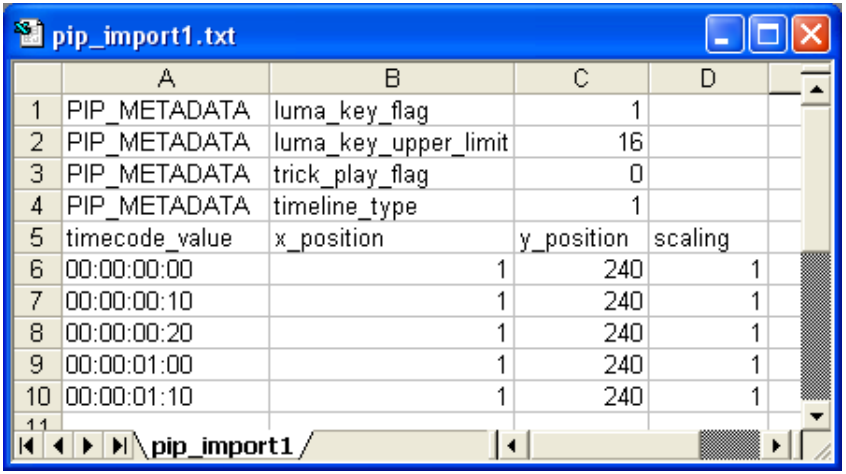



PiP Editor - [balloons.264.ves]
File Edit View
firstmovie-[AirMuseum_1080p23976.m
Validate All
00:00:00:00
00:00:10:00
00:00:16:00
00:00:20:00
00:00:30:00
00:00:33:11
Common Parameters
Timeline Type
SubPath(Async)
Trick Playing Flag
Use Luma Key
Luma Key
Mark Parameters
Time Stamp
00:00:16:00
Scaling
Quarter
Position
X
1344
Y
633
00:00:16:00
3 mark(s)


PiP Editor - [balloons.264.ves]
File Edit View
firstmovie-[AirMuseum_1080p23976.m
Validate All
00:00:00:00
00:00:10:00
00:00:20:00
00:00:24:00
00:00:30:00
00:00:33:11
Common Parameters
Timeline Type
SubPath(Async)
Trick Playing Flag
Use Luma Key
Luma Key
Mark Parameters
Time Stamp
00:00:24:00
Scaling
Quarter
Position
X
1344
Y
533
00:00:24:00
3 mark(s)

Importing PiP EDL files

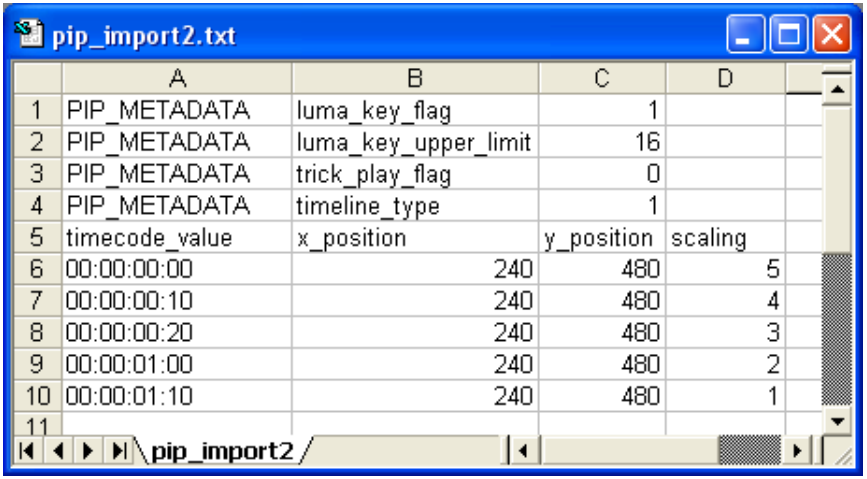
Scenarist BD allows you to import EDL (Edit Decision List) files in order to specify various aspects of your PiP images. The simplest format to use for these files is tab-separated values text, which is easy to create in Microsoft Excel using the “Save As Text (tab delimited) (*.txt)” function. For example:



pip_import1.txt

	A	B	C	D
1	PIP_METADATA	luma_key_flag	1	
2	PIP_METADATA	luma_key_upper_limit	16	
3	PIP_METADATA	trick_play_flag	0	
4	PIP_METADATA	timeline_type	1	
5	timecode_value	x_position	y_position	scaling
6	00:00:00:00	1	240	1
7	00:00:00:10	1	240	1
8	00:00:00:20	1	240	1
9	00:00:01:00	1	240	1
10	00:00:01:10	1	240	1
11				

pip_import1



pip_import2.txt

	A	B	C	D
1	PIP_METADATA	luma_key_flag	1	
2	PIP_METADATA	luma_key_upper_limit	16	
3	PIP_METADATA	trick_play_flag	0	
4	PIP_METADATA	timeline_type	1	
5	timecode_value	x_position	y_position	scaling
6	00:00:00:00	240	480	5
7	00:00:00:10	240	480	4
8	00:00:00:20	240	480	3
9	00:00:01:00	240	480	2
10	00:00:01:10	240	480	1
11				

pip_import2

The first four lines of the file contain PiP metadata parameters, which are optional. Each line has the following format:

```
PIP_METADATA    <parameter_name>    <parameter_value>
```

The metadata parameters have the following possible values:

- luma_key_flag: 0 (upper limit value is ignored), 1 (upper limit value is used).
- luma_key_upper_limit: 0-255 (required if luma_key_flag = 1).
- trick_play_flag: 0 (PiP window is closed when primary video trick play), 1 (PiP window is open, if possible, when primary video trick play).
- timeline_type: 1 (synchronous, playitem), 2 (asynchronous, subpath), 3 (asynchronous, playitem).

The data portion of the file starts with a row of column headers, which are required:

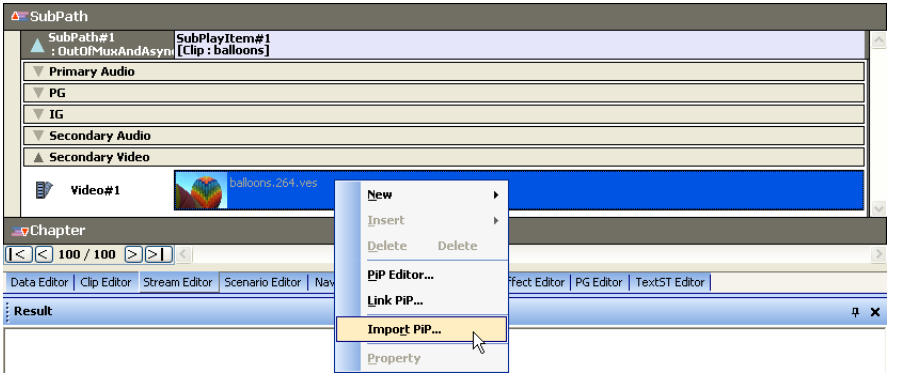
- "timecode_value"
- "x_position"
- "y_position"
- "scaling"

The data lines themselves have the following range of values:

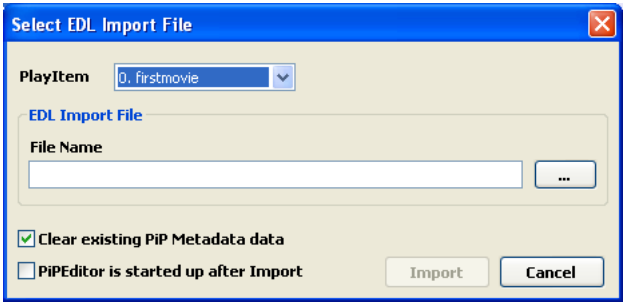
- timecode_value: given in (hh:mm:ss:ff) format, and must have the same frame rate as the primary video.
- x_position: from 0 to video_width-1.
- y_position: from 0 to video_height-1.
- scaling: 1-5; if set to 5, x_position and y_position must be set to 0.

To import PiP EDL information:

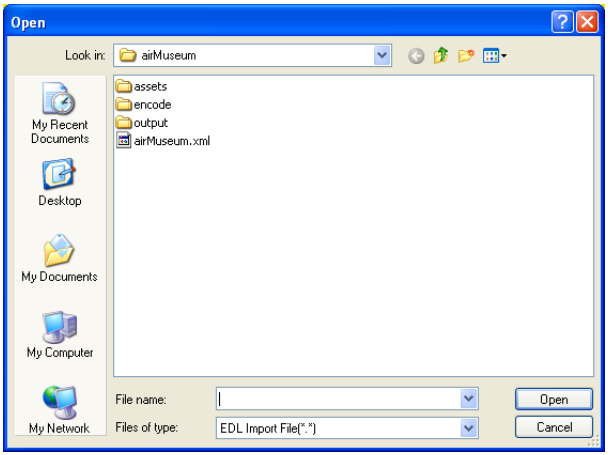
1 In the Stream Editor, right-click on the Picture-in-Picture video asset in the SubPath, then select PiP Editor from the shortcut menu.



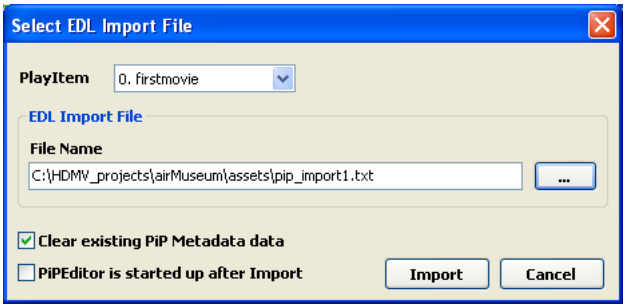
The Select EDL Import File dialog box appears.



2 Click the Browse button next to the File Name field. The Open dialog box appears.



3 Locate and select the PiP EDL import file you want to use; then click Open. The path to the file appears in the File Name field.



4 If appropriate, click the “Clear existing PiP Metadata data” checkbox to uncheck (deselect) the option.

5 To open the PiP Editor after the program imports the EDL file, check the “PiPEditor is started up after Import” option.

6 Click Import. Scenarist BD imports the EDL information in the file.

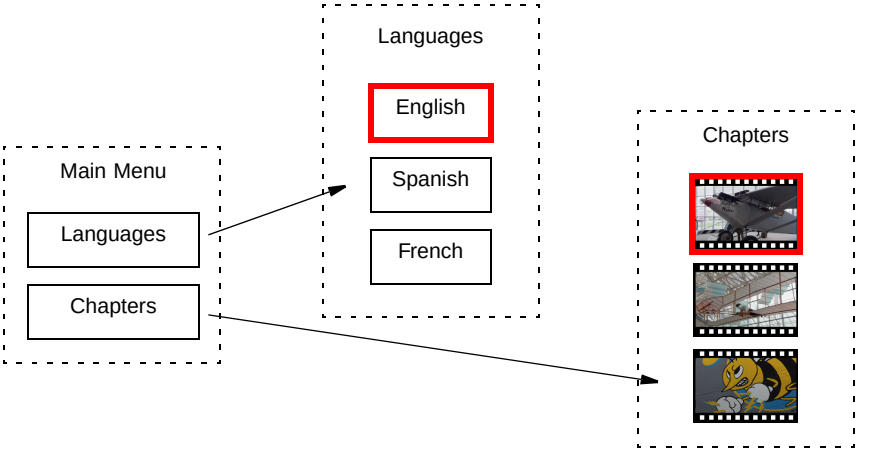
10 Interactive graphics

This chapter documents how to add interactive graphics to Scenarist BD projects. It includes the following topics:

- "Interactive graphics" on page 208
- "Creating interactive graphics" on page 209

Interactive graphics

Interactive graphics are used to navigate the content on BD titles, usually in the form of buttons that appear on-screen. The buttons can be always on, as would be the case for Top Menus, or they can be called by the viewer as needed (pop-up menus) during playback of titles. Also, the buttons available for a title need not be static; in fact, an entirely new set of buttons can appear after clicking a particular button (multi-page or hierarchical menus).



Multi-page menu

Either PNGs or TIFFs can be used as assets for interactive graphics.

The HDMV format supports to 256 colors (8 bits) for interactive graphics. Images must be saved as indexed. HDMV also supports alpha channel (variable transparency) information with PNG files; however, it stores alpha information in the palette, per color (rather than per pixel).

Creating interactive graphics

Interactive graphics (IGs) are created in Scenarist BD with virtual graphic assets. The following sections document how to create IG virtual assets, define their content (including "click sounds), encode them, and add them to Clips:

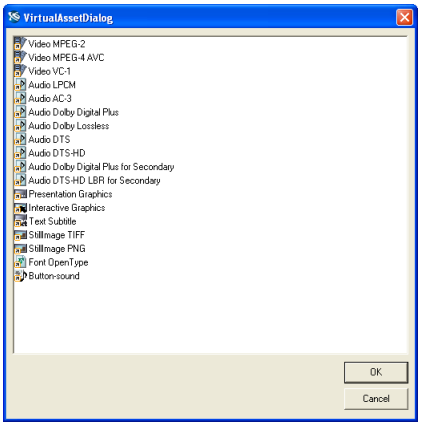
- "Creating IG virtual assets" on page 210
- "Defining content for IG virtual assets" on page 215
- "Adding "click" sounds to buttons" on page 227
- "Encoding IGs" on page 229
- "Adding IGs to projects" on page 230

Note: It is also possible to create IGs in Adobe Photoshop. Then you can use Scenarist Designer PS (a Photoshop plug-in) to optimize them, and export them in a format that can be imported directly into Scenarist BD. For more information, see "Importing/updating Designer PS files" on page 325; also, see the *Scenarist Designer PS User Guide*.

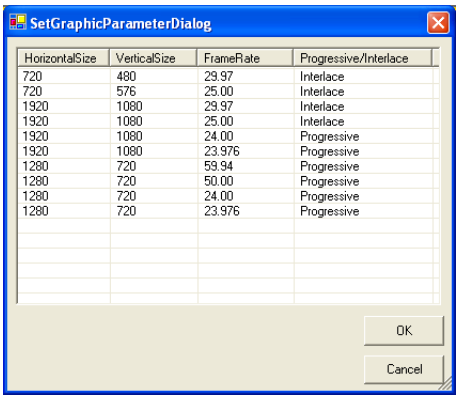
Creating IG virtual assets

To create an IG virtual asset:

1. In the Data Tree, right-click the folder to which you will add the IG virtual asset, and choose New > Virtual Asset from the shortcut menu. The Virtual Asset dialog box appears.



2. Select Interactive Graphics, then click OK. The Set Graphic Parameter dialog box appears.

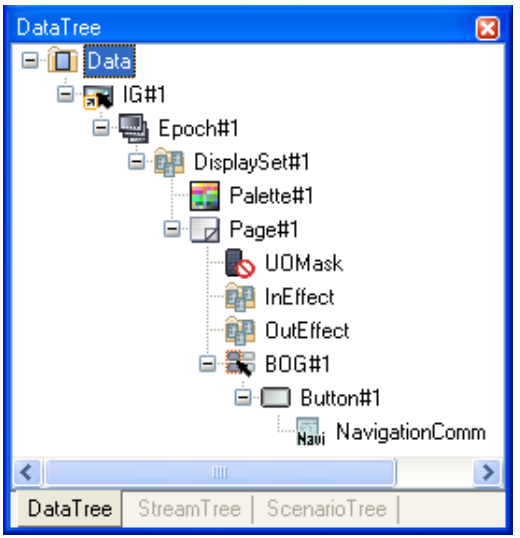


3 Select the parameters used by the video or still image background of the IG, then click OK. An IG virtual asset is added to the folder.

4 To rename the IG virtual asset, click its name twice so it becomes selected, enter the new name, and press Enter.

5 If appropriate, change the Language Code for the virtual asset (see “Changing the Language Code for assets” on page 77).

6 Add additional required components to the IG virtual asset. When completed, it should look like this:



- Right-click the IG virtual asset and choose New > Virtual Asset from the shortcut menu. In the Virtual Asset dialog box, select Epoch and click OK. An Epoch object is added to the IG virtual asset.
- Expand the IG virtual asset, right-click the Epoch object, and choose New > Virtual Asset from the shortcut menu. In the Virtual Asset dialog box, select Display Set and click OK. A Display Set object is added to the Epoch, and a Palette object is added automatically to the Display Set.

- Right-click the Display Set object and choose > New > Virtual Asset from the shortcut menu. In the Virtual Asset dialog box, select Page and click OK. A Page object is added to the Display Set; UOMask, InEffect, and OutEffect objects are added automatically to the Page.

  Note: For each button or group of buttons that appear on-screen at the same time, you must create a Page object. For multi-page menus, multiple Page objects, each containing its own set of buttons, can be added.

- Expand the Display Set and Page objects, right-click the Page object, and choose New > Virtual Asset from the shortcut menu. In the Virtual Asset dialog box, select Button Overlap Group and click OK. A BOG object is added to the Page.

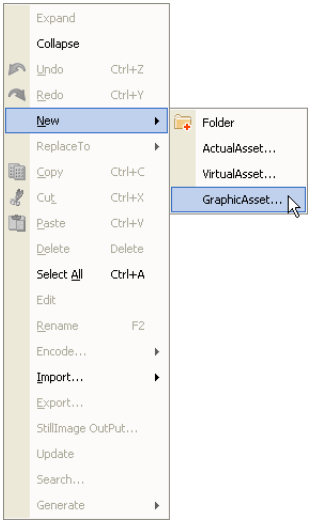
- Right-click the BOG object and choose New > Virtual Asset from the shortcut menu. In the Virtual Asset dialog box, select Button and click OK. A Button object is added to the BOG, and a Navigation Command object is added automatically to the Button.

Creating IG virtual assets with a single operation

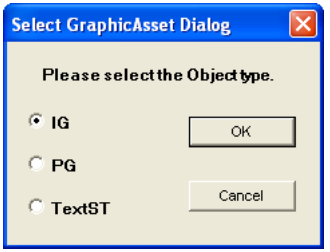
Instead of building IG virtual assets step by step, as described in "Creating IG virtual assets," above, it is possible to create them using a single operation.

To create an IG virtual asset with a single operation:

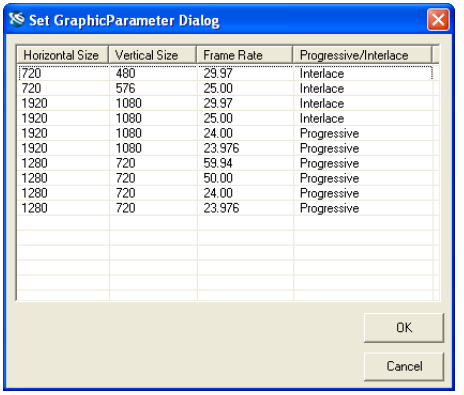
1 In the Data Tree, right-click the folder to which you will add the IG virtual asset, and choose New > Graphic Asset from the shortcut menu.



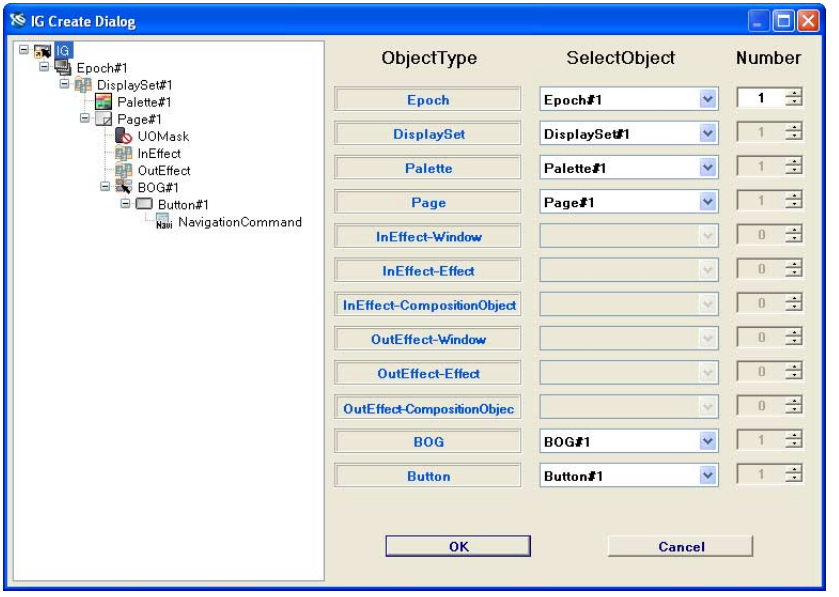
2 The Select Graphic Asset dialog box appears.



3 Select IG, then click OK. The Set Graphic Parameter dialog box appears.

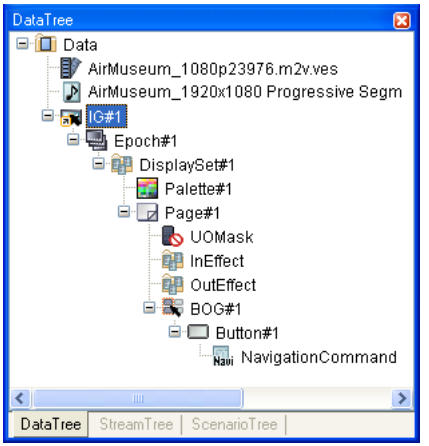


4 Select the parameters used by the video or still image background of the IG, then click OK. The IG Create dialog box appears.



5 To add objects to the IG virtual asset, select the type of object in the tree view (or the folder to which a new object will belong), then select the number of objects you want using the arrows in the appropriate Number field.

6 When you are finished defining your IG virtual asset, click OK. The IG appears in the Data Tree.

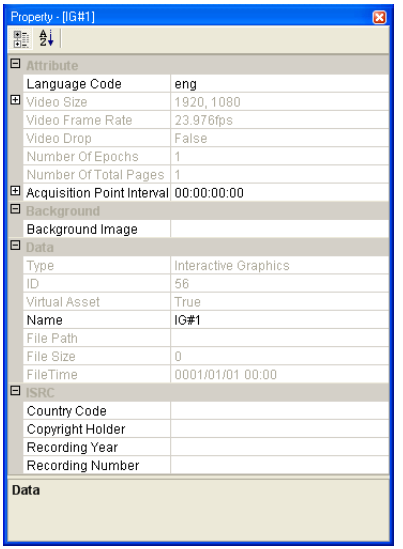


Defining content for IG virtual assets

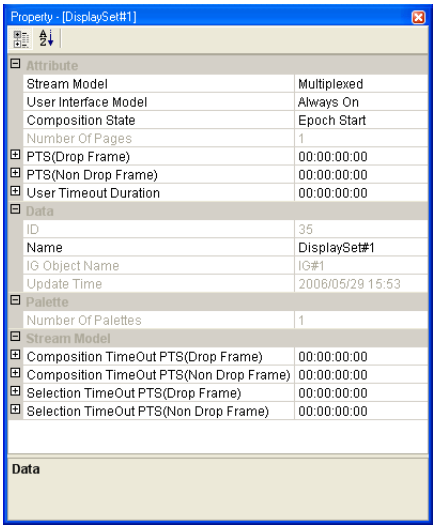
To define content for an IG virtual asset:

1 Expand the IG virtual asset in the Data Tree so all of its components are visible.

2 In the Data Tree, select the IG virtual asset, then set the Acquisition Point Interval in the Properties window.



3 In the Data Tree, select the Display Set object, then select or enter appropriate values in the Properties window.



- **Stream Model** sets the type of data stream for the IG Display Set; options are Multiplexed and Non Multiplexed.
- **User Interface Model** sets how the IG Display Set appears to the user; options are Always On and Pop Up.
- **Composition State** sets the composition state for the IG Display Set; options are:

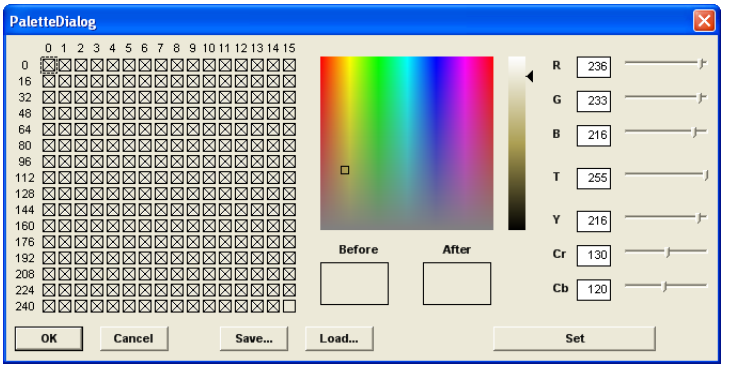
  - **Normal Case** means that the Display Set contains only elements that are changed from the previous composition.
  - **Acquisition Point** means that the Display Set contains all elements needed to display the next composition.

    - **Epoch Start** indicates the start of a new Epoch; the Display Set contains all elements needed to display the next composition.
    - **Epoch Continue** means that the Epoch may be continued across into this graphics stream from the previous graphics stream when seamless connection conditions apply. The Display Set contains all elements needed to display the next composition.

- **PTS Drop Frame** sets the PTS start time for the IG Display Set (in drop frame contexts); you may need to adjust this value to allow for decoding time (depending on the size of the IG).
- **PTS Non Drop Frame** sets the PTS start time for the IG Display Set (in non drop frame contexts); you may need to adjust this value to allow for decoding time (depending on the size of the IG).
- **User Timeout Duration** sets how long the IG Display Set is displayed with no user activity before it is removed. If set to zero (00:00:00:00), the duration is "infinite"; if User Interface Model is "Always On," the timeout duration is taken to be zero ("infinite"); if User Interface Model is "Pop Up," the IG Display Set disappears after the timeout duration.
- **Composition Timeout PTS (Drop Frame)** sets how long the IG is displayed (in drop frame contexts) before it is removed.
- **Composition Timeout PTS Non Drop Frame)** sets how long the IG is displayed (in non drop frame contexts) before it is removed.
- **Selection Timeout PTS (Drop Frame)** sets the valid interaction time within an Epoch (in drop frame contexts).
- **Selection Timeout PTS Non Drop Frame)** sets the valid interaction time within an Epoch (in non drop frame contexts).

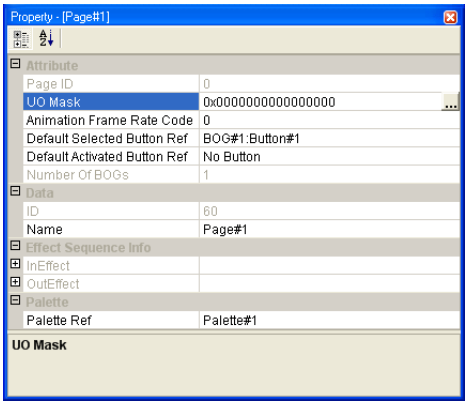
4 Set the palette for the IG virtual asset:

- In the Data Tree, double-click the Palette object for the IG virtual asset. The Palette dialog box appears.



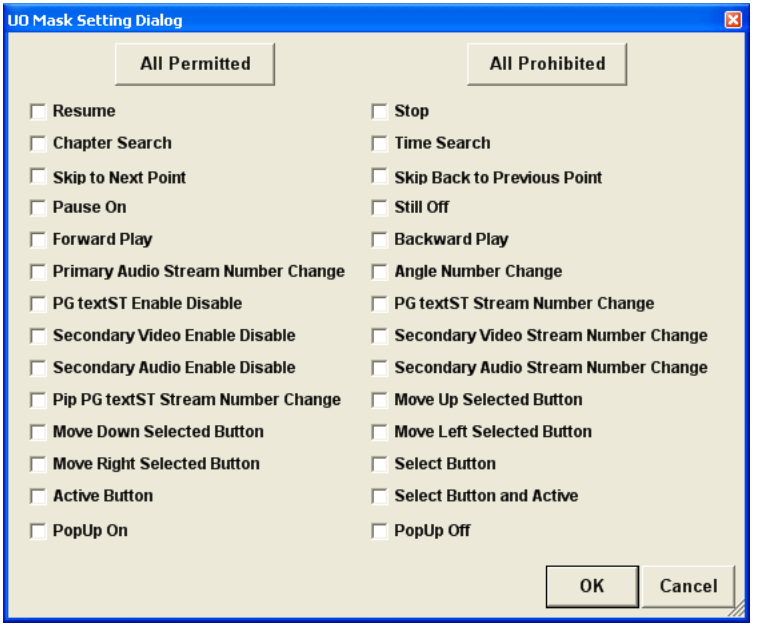
- Click Load. The Load File dialog box appears.
- Select one of the button images that will be referenced by the IG virtual asset, then click Open. Any other button images in the IG track must share this same palette.
- Click OK to close the Palette dialog box.

5 In the Data Tree, select the Page object; in the Properties window, click the browse button next to the UO Mask field.



The UO Mask Setting dialog box appears.

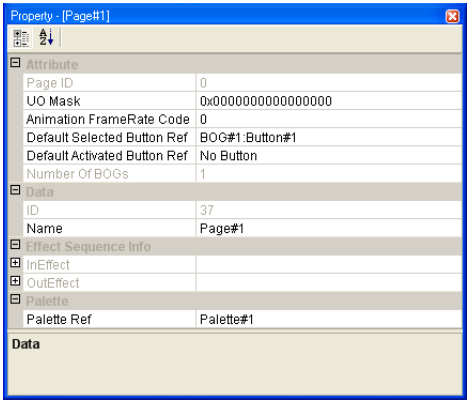
6 Specify which user operations will be permitted for the IG Page:



- Select user operations you want to prohibit (checked items will not be available to the user).
- To prohibit all user operations, click All Prohibited.
- To permit all user operations, click All Permitted.

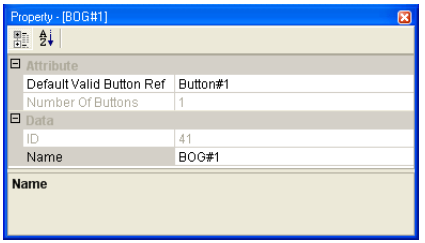
7 Click OK to close the UO Mask Setting dialog box.

8 In the Page Properties window, select or enter appropriate values.



- **Animation FrameRate Code** sets the animation frame rate, which is the video frame rate divided by the value of the Animation FrameRate Code; if set to “0,” only the first frame of a button animation sequence is displayed.
- **Default Selected Button Ref** sets the default selected button when the page is first loaded.
- **Default Activated Button Ref** sets the default button activated when the page times out.

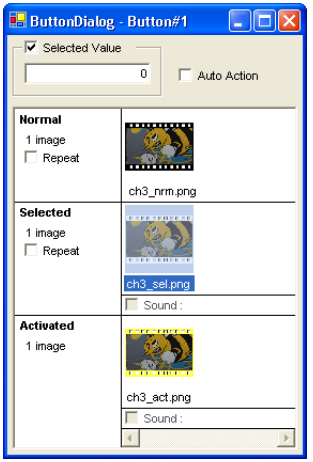
9 In the Data Tree, select the BOG (Button Overlap Group) object, then set the Default Valid Button Ref in the Properties window.



This is the default button of the group to show when the BOG is first displayed; if there is only one button in the group, it will be the only option.

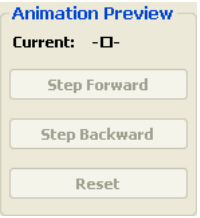
10 In the Data Tree, double-click the Button object. The Button dialog box appears.

11 Set the images for the button's three states. Drag images from either the Data Editor or the Data Tree onto the Normal, Selected, and Activated areas.

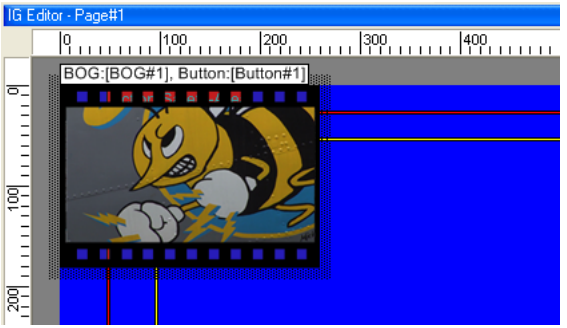


Note: To create animated button effects, you can drag multiple images (up to 256) to a button state. If you wish an animation sequence to repeat, click the Repeat option to select it.

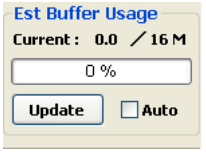
Note: The newest version of Scenarist BD (version 4.5 Final) includes an Animation Preview feature, which allows you to view each of the images in an animation sequence:



12 Close the Button dialog box by clicking the Close button in the upper right corner. In the Data Tree, double-click the Page object for the IG virtual asset. The button is displayed in the IG Editor. Position the button as necessary by dragging to a new location, or by entering values in the Button Position field in the Property window.



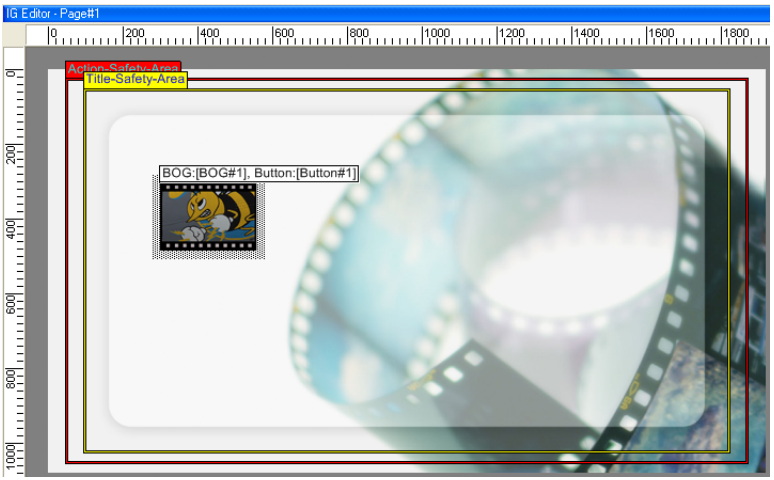
Note: In the newest version of Scenarist BD (version 4.5 Final), the IG Editor includes an Estimation Buffer Usage box:



This gives an estimate of the buffer usage required by the IG.

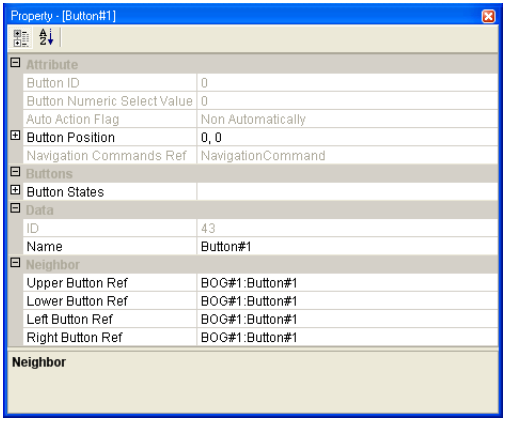
13 To display a background image in the IG Editor, to help in placement of the button, do the following:

- Right-click in the IG Editor and choose Background from the shortcut menu.
- In the BackGroundColor dialog box, select the Use Of Image option.
- Click the Browse button next to the File field and select the background image you want to use, then click Open.
- Click OK to close the BackColor dialog box. The background image is displayed in the IG Editor.



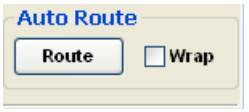
Note: You can use the Zoom buttons in the toolbar to display the entire screen area, so you have a better sense of the placement of the button.

14 In the Data Tree, select the Button object, then select or enter appropriate values in the Properties window.

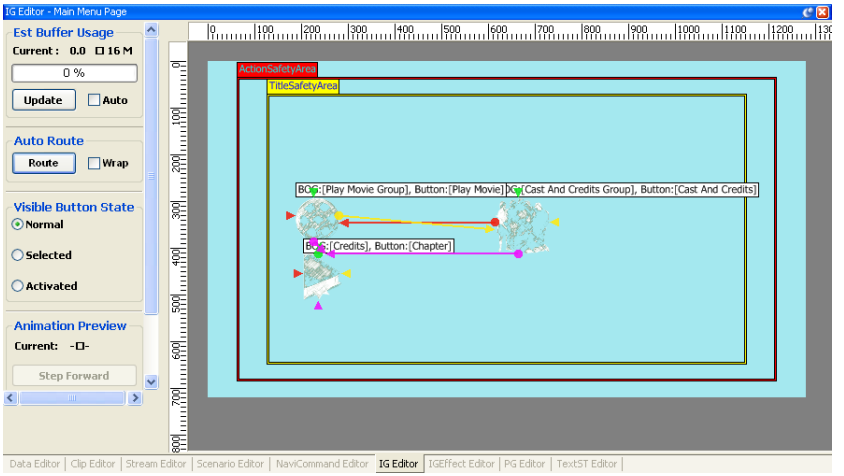


- **Upper Button Ref** sets the button that is selected when the user clicks "up."
- **Lower Button Ref** sets the button that is selected when the user clicks "down."
- **Left Button Ref** sets the button that is selected when the user clicks "left."
- **Right Button Ref** sets the button that is selected when the user clicks "right."

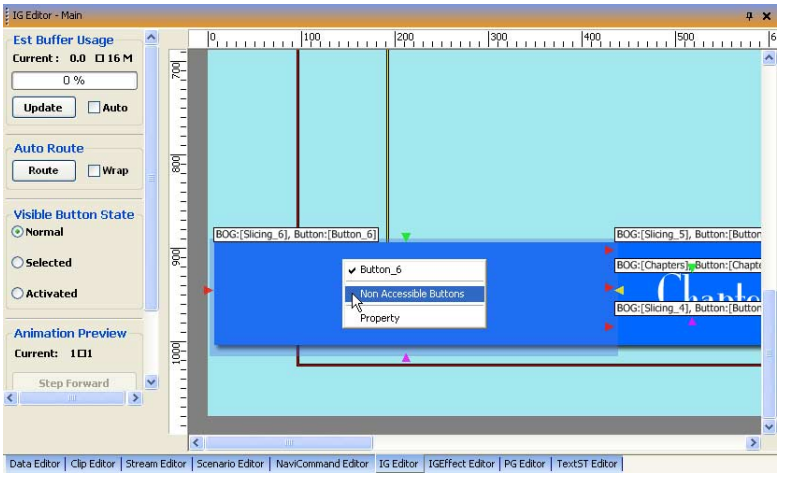
15 To create a mapping for a set of buttons automatically, click Route in the Auto Route group box:



Scenarist BD creates and displays the mapping for the buttons:



16 To designate a (background) button as not user accessible, right-click on the button and select Non Accessible Buttons from the shortcut menu.

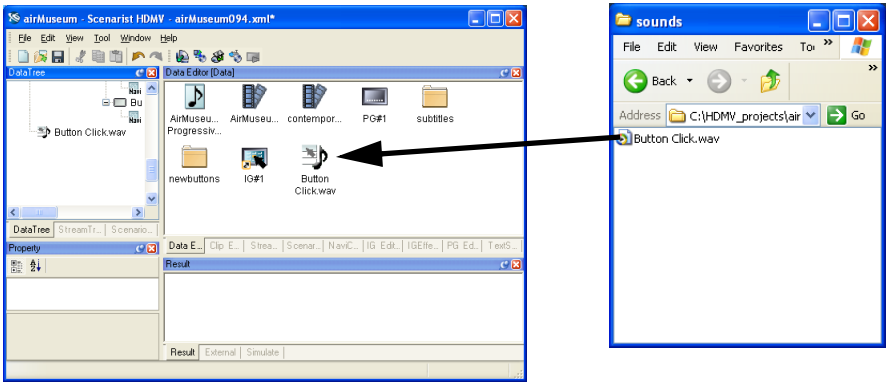


Once the button is designated as not user accessible, a checkmark appears next to the option in the shortcut menu.

Adding "click" sounds to buttons

To add a "click" sound to a button state:

1. Drag an LPCM-formatted "click" sound file (.lpcm, .pcm, or .wav) into the Data Editor.



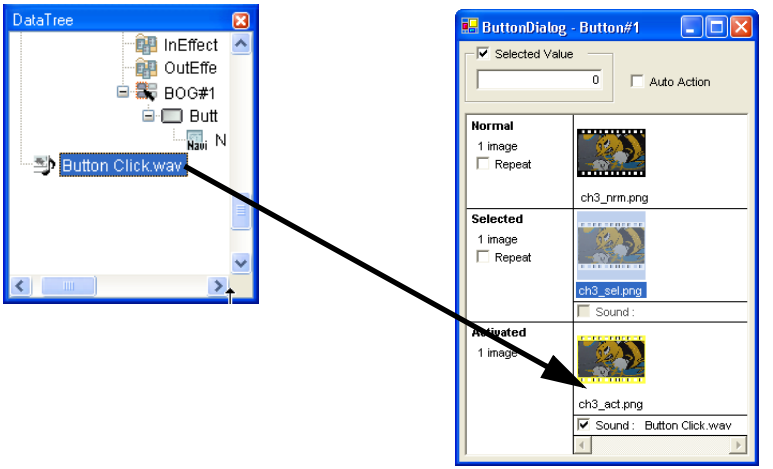
The wave file also appears in the Data Tree.

Note: The sound file must be LPCM, 48 kHz, 16-bit, stereo.

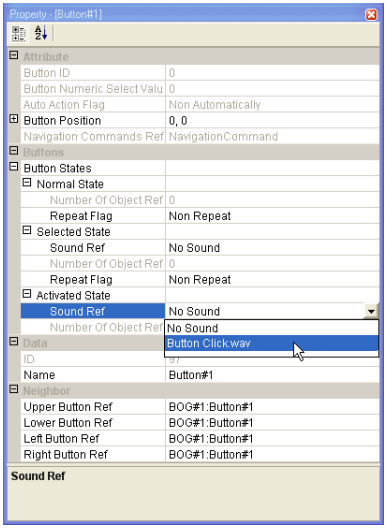
Note: Do not use the MUI Generator on the sound file.

2. Open the Button dialog box for the button to which you will add the sound.
3. Do one of the following:

- Drag the sound file from the Data Tree to the appropriate button state in the Button dialog box.



- Open the Properties window for the button, and select the sound file for the appropriate button state.



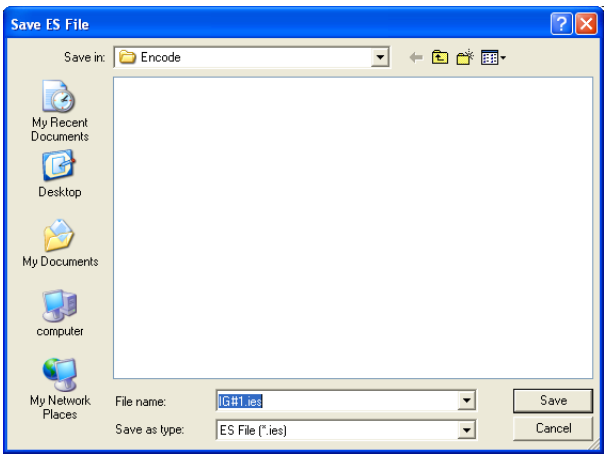
Encoding IGs

To encode an IG:

1 In the Data Tree, right-click the IG and choose Encode from the shortcut menu.

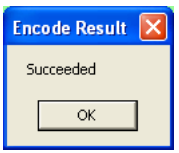
Note: Any IG that is unencoded shows this icon in the Data Tree:

2 Choose Edit > Encode > Build. The Save ES File dialog box appears.



Note: The dialog box automatically selects the Encode folder path that was defined when you created the project.

3 Click Save. Scenarist BD encodes the IG. An Encode Result dialog box appears.



4 Click OK. The IG is encoded.

Note: Any IG that is encoded shows this icon in the Data Tree:

If the IG asset encodes successfully, you are ready to add it to a Clip.

Note: The Encode > Rebuild option is available if you lose the ES (elementary stream) that is created when you encode a virtual asset. Scenarist BD maintains links to any still images used in the creation of virtual assets.

Adding IGs to projects

IGs are added to projects by including them in Clips, or in SubPaths of PlayLists. Adding an IG to a SubPath of a PlayList involves the following steps:

- Creating a Clip for the IG.
- Creating an IG SubPath for the PlayList.
- Adding the IG Clip to the IG SubPath of the PlayList.

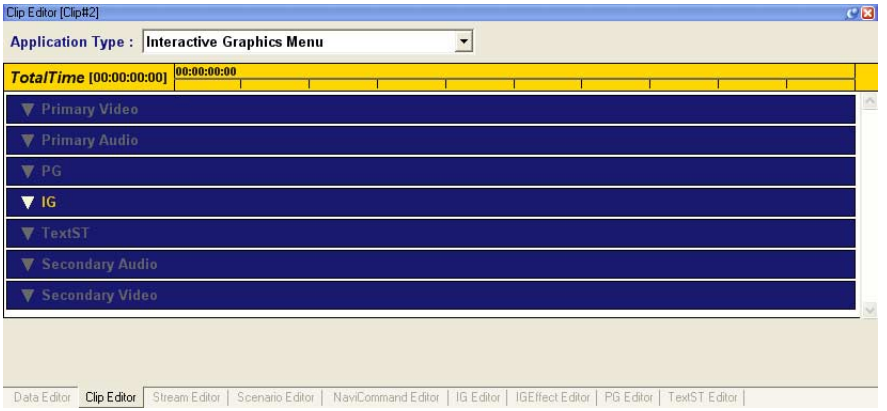
These steps are documented in the following procedure.

To add an IG to a project:

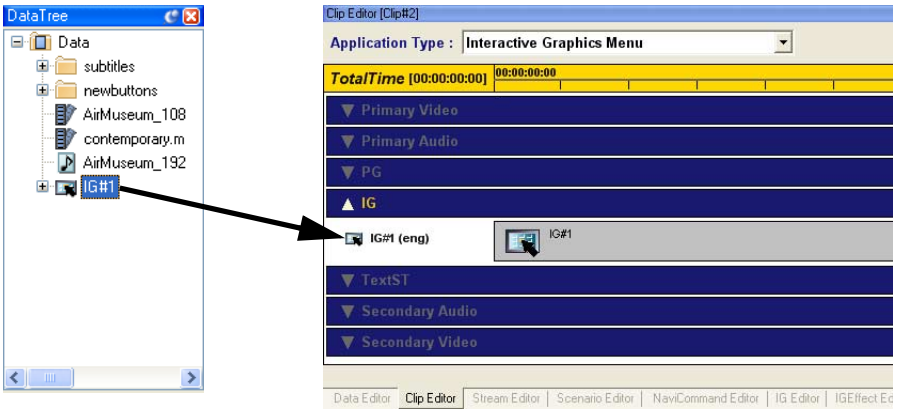
1 In the Stream Tree, right-click the Clip folder to which you will add the IG Clip, and choose New > Clip > Interactive Graphics Menu from the shortcut menu. The Clip appears in the Stream Tree.

2 To rename the Clip, click its name twice so it becomes selected, enter the new name, and press Enter.

3 Double-click the Clip to display it in the Clip Editor.



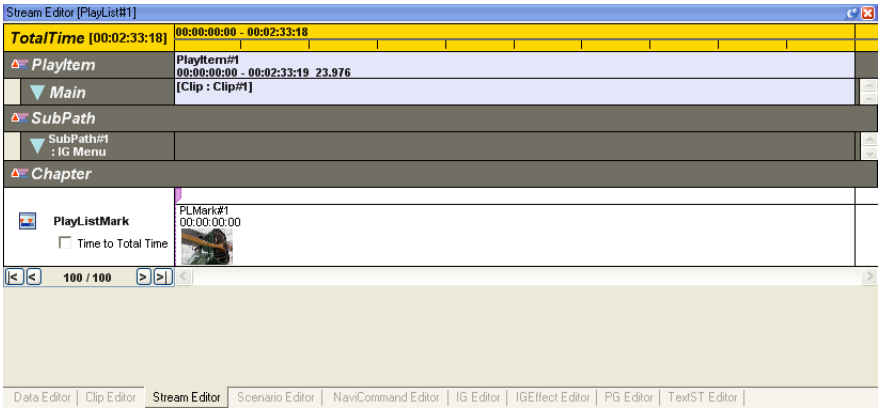
4 Select the Data Tree; then Drag the IG asset from the Data Tree onto the IG track in the Clip Editor. The IG is added to the Clip.



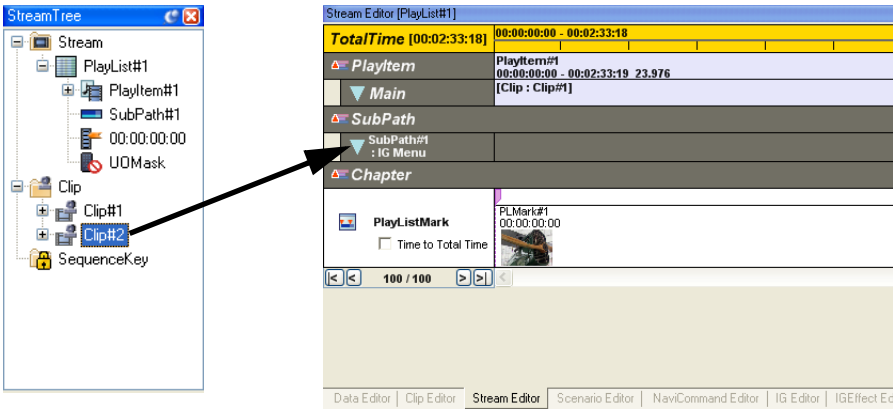
5 In the Stream Tree, right-click the PlayList to which you will add the IG Clip, and choose New > SubPath > Interactive Graphics Menu from the shortcut menu. The SubPath appears in the Stream Tree.

6 To rename the SubPath, click its name twice so it becomes selected, enter the new name, and press Enter.

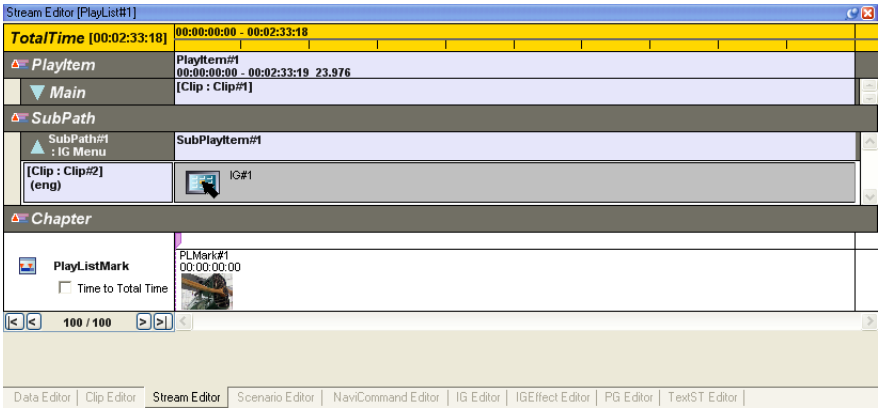
7 Double-click the PlayList to display it in the Stream Editor.



8 Drag the IG Clip from the Stream Tree onto the IG SubPath track in the Stream Editor.



The IG Clip is added to the project as a SubPath of the PlayList.



11 Interactive graphic effects

This chapter documents how to create interactive graphic effects in Scenarist BD projects. It includes the following topics:

- "Interactive graphic effects" on page 236
- "Creating InEffect or OutEffect sequences" on page 236

Interactive graphic effects

The BD format allows you to add simple animation effects — such as color changes, movement, and wipes — to interactive graphics. These effects take two forms:

InEffect Operates just before the page containing the effect loads.

OutEffect Operates just before the page containing the effect becomes inactive.

Each animation effect is created by a series of Effect objects that combine to form an effects sequence. An InEffect or OutEffect sequence can have up to 128 animation steps (Effect objects). Scenarist BD includes an Effect Wizard that generates effects sequences automatically, based on user-defined Start and End points.

Creating InEffect or OutEffect sequences

The following sections document how to add IG effect virtual assets for InEffect sequences and OutEffect sequences, set the Window properties, add graphics, use the Effect Wizard to generate an effects sequence, and re-encode the IG to include the IG effect data:

- "Adding IG InEffect virtual assets" on page 237
- "Adding IG OutEffect virtual assets" on page 239
- "Setting IG effect Window properties" on page 241
- "Adding graphics to an effect" on page 242
- "Using the Effect Wizard" on page 245
- "Re-encoding IGs" on page 250

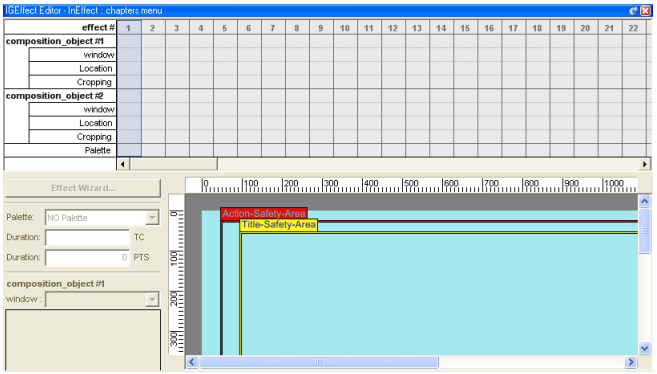
Note: The procedures for setting Window properties, adding graphics to an effect, using the Effect Wizard, and re-encoding IGs are exactly the same for InEffects and OutEffects.

Adding IG InEffect virtual assets

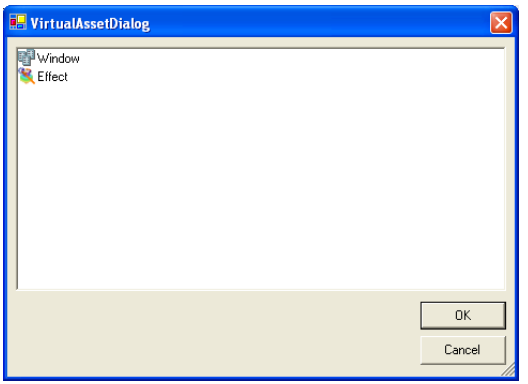
To add IG InEffects virtual assets:

1 In the Data Tree, double-click the InEffect to which you will add virtual assets.

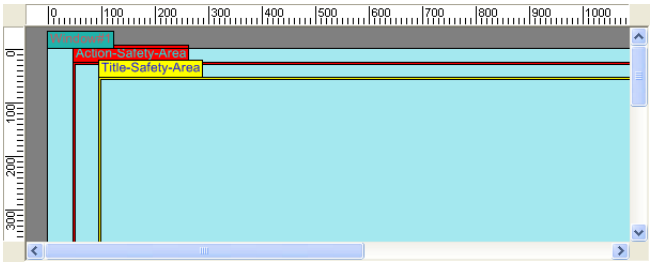
The IG Effect Editor appears. The title bar shows that an InEffect is selected.



2 Right-click the InEffect object in the Data Tree and choose New > Virtual Asset from the shortcut menu. The Virtual Asset dialog box appears.



3 Select Window, then click OK. A Window icon appears in the IG Effect Editor, and a Window object is added to the Data Tree.



Note: The other two objects in the screen area of the IG Effect Editor show the Title-Safe-Area and Action-Safe-Area of a television screen.

4 Right-Click the InEffect object, then choose New > Virtual Asset from the shortcut menu. In the Virtual Asset dialog box, select Effect, then click OK. An Effect object appears in the Data Tree.

5 To rename a virtual asset, click its name twice so it becomes selected, enter the new name, and press Enter.

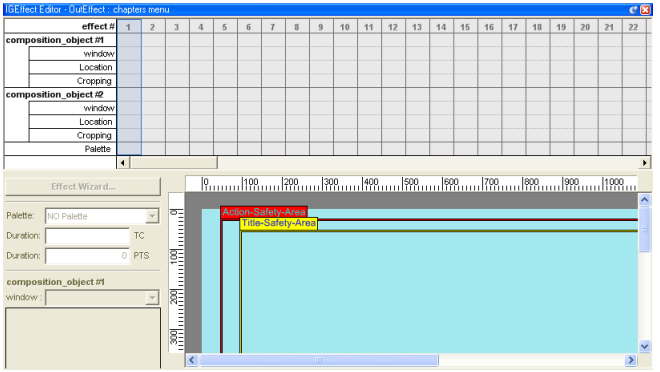
6 Proceed to “Setting IG effect Window properties” on page 241.

Adding IG OutEffect virtual assets

To add IG OutEffects virtual assets:

1 In the Data Tree, double-click the OutEffect to which you will add assets.

The IG Effect Editor appears. The title bar shows that an OutEffect is selected.



2 Right-click the OutEffect object in the Data Tree and choose New > Virtual Asset from the shortcut menu. The Virtual Asset dialog box appears.

3 Select Window, then click OK. A Window icon appears in the IG Effect Editor, and a Window object is added to the Data Tree.

4 Right-Click the OutEffect object, then choose New > Virtual Asset from the shortcut menu. In the Virtual Asset dialog box, select Effect, then click OK. An Effect object appears in the Data Tree.

5 To rename a virtual asset, click its name twice so it becomes selected, enter the new name, and press Enter.

6 Proceed to “Setting IG effect Window properties” on page 241.

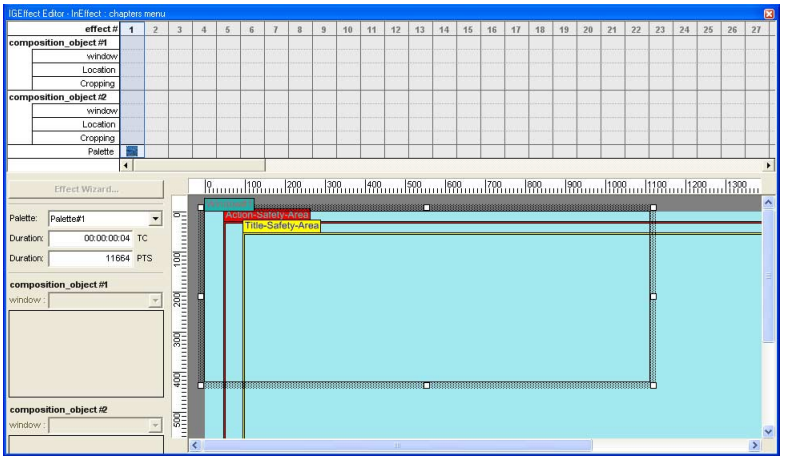
Setting IG effect Window properties

The Window defines the area of the screen in which the IG effect can take place.

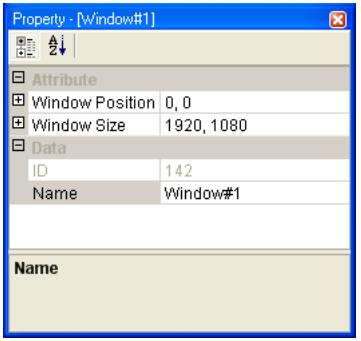
To set IG effect Window properties:

1 Do one of the following:

- Move or resize the Window in the IG Effect Editor.



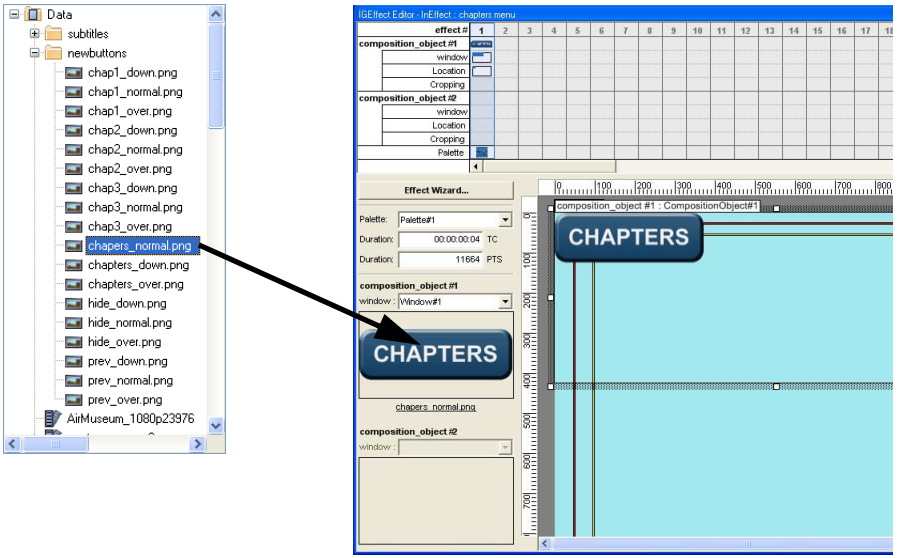
- In the Data Tree, select the Window object, then enter Position and Size values in the Properties window.



Adding graphics to an effect

To add graphics to an effect:

1 Drag a graphic from the Data Tree into one of the Composition Object rectangles in the IG Effect Editor.

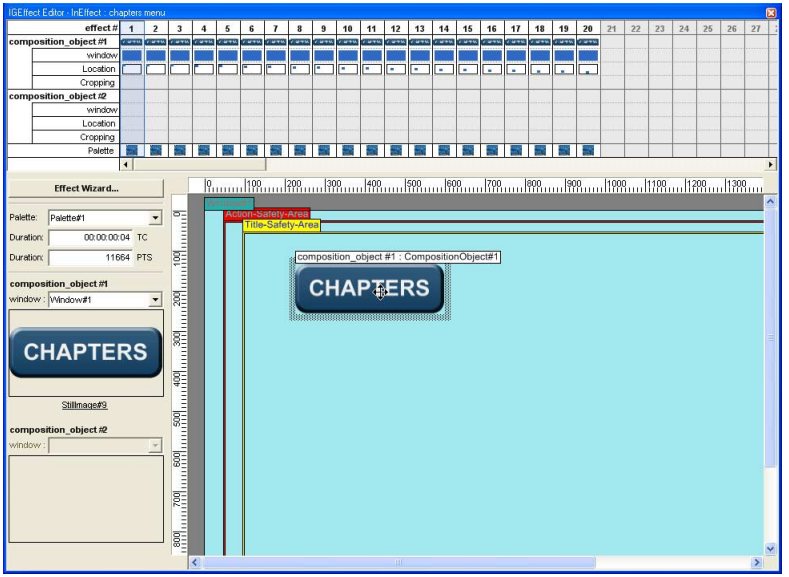


A Composition Object appears beneath the Effect object in the Data Tree.

Note: You can have as many as two Composition Objects per effects sequence.

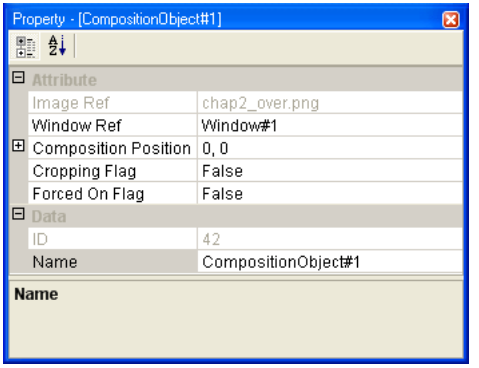
2 To set the initial position of the Composition Object, do one of the following:

- Move the Composition Object to a Start location in the IG Effect Editor.

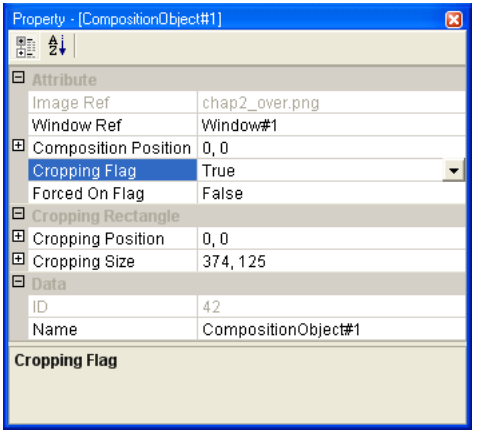


Note: You can use the Zoom buttons in the toolbar to display the entire screen area, so you have a better sense of the placement of the Composition Object.

- In the Data Tree, select the Composition Object, then enter Composition (Start) Position values in the Properties window.



3 To crop the Composition Object, select it the Data Tree, then set the Cropping Flag to True in the Properties window. Cropping Rectangle parameters appear.



Enter new values for Cropping Position and Cropping Size.

4 If appropriate, change the Forced On Flag value in the Composition Object Properties window from False to True.

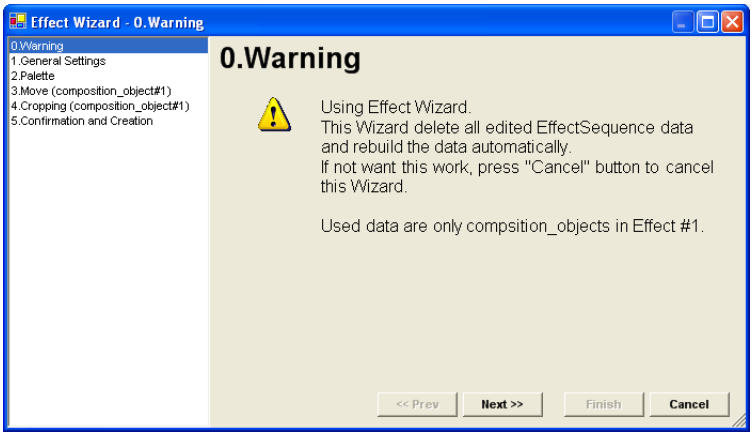
Using the Effect Wizard

Once you have added a graphic Composition Object to an Effect and defined its location, you can use the Effect Wizard to generate an effects sequence automatically.

To use the Effect Wizard:

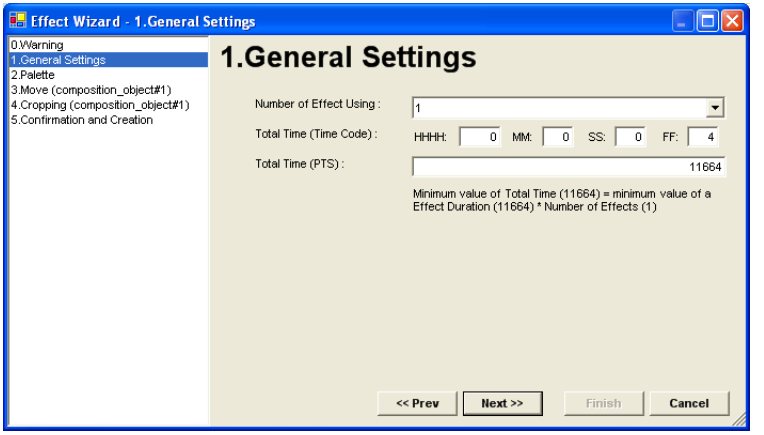
1 In the IG Effect Editor, click the Effect Wizard button.

The Effect Wizard window appears.



Note: Effects sequence data you create using the Effect Wizard will replace any previous effects sequence data for the selected InEffect or OutEffect.

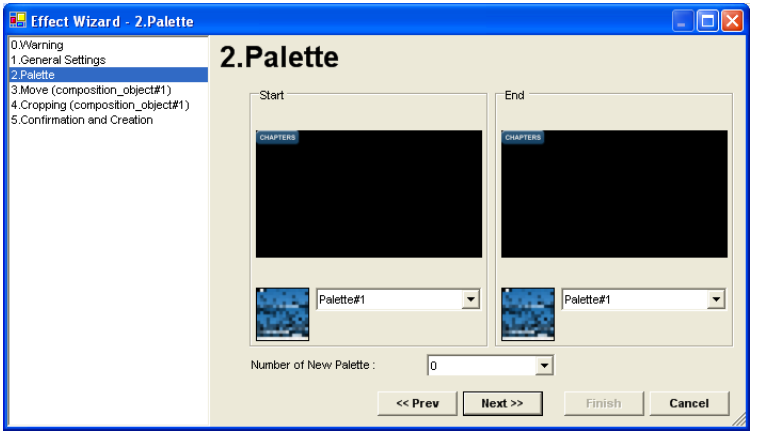
2 Click Next. The Step 1 page appears.



3 In the Number of Effect Using box, type or select the number of effect frames for the effects sequence (the range is 1–128). The Wizard calculates a minimum Total Time value for the effects sequence, based on the number of effect frames.

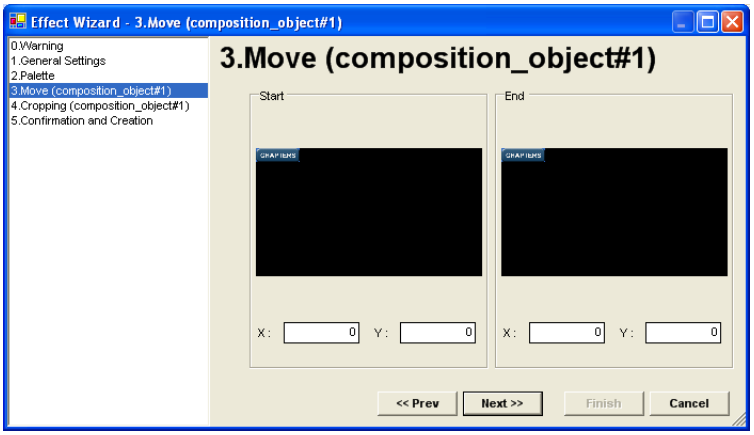
4 If appropriate, adjust the Total Time (Time Code) values for the effects sequence. Total Time (PTS) is calculated automatically.

5 Click Next. The Step 2 page appears.

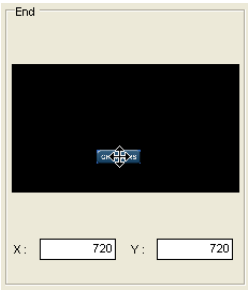


6 To create a color change effect, select an Start and an End Palette; then select the number of intermediate Palette steps.

7 Click Next. The Step 3 page appears.

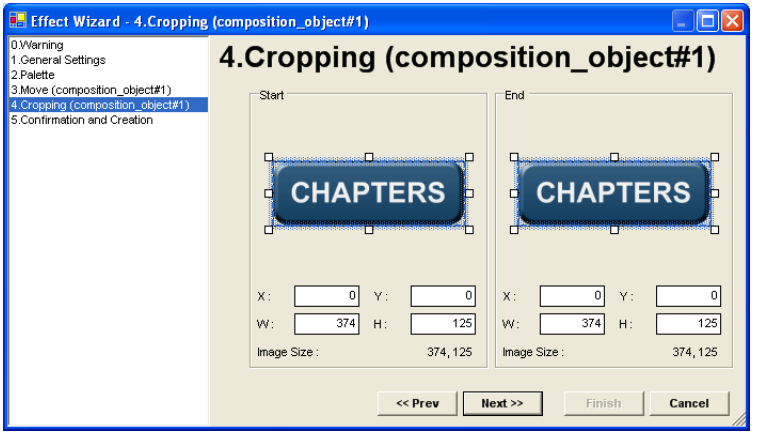


8 To create a motion effect, drag the Composition Object to an End location. For example:



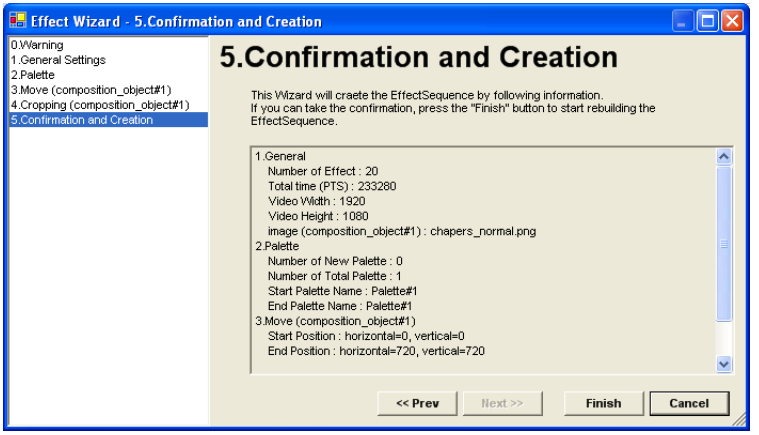
Note: If you have two Composition Objects, the Effects Wizard will prompt you to select locations for each one.

9 Click Next. The Step 4 page appears.

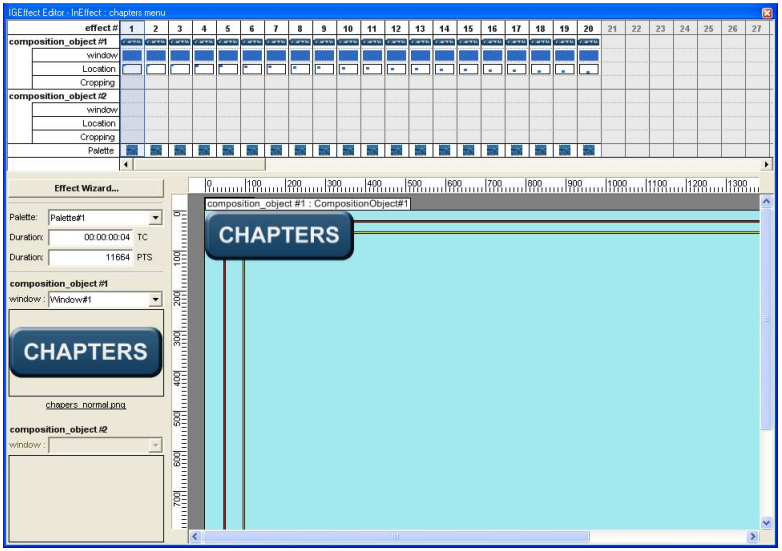


10 To create a wipe (cropping) effect, select Start and End cropping by moving the cropping indicators.

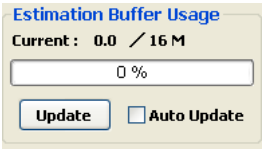
11 Click Next. The Step 5 summary page appears.



12 Click Finish. The Effect Wizard generates an effects sequence that moves gradually from the Start parameters to the End parameters, using the number of effects frames you specified in the Step 1 window. The IG Effect Editor displays the effects in the completed sequence.



Note: In the newest version of Scenarist BD (version 4.5 Final), the IG Effect Editor includes an Estimation Buffer Usage box:



This gives an estimate of the buffer usage required by the IG effect.

The Data Tree also displays the new set of Effects.

Re-encoding IGs

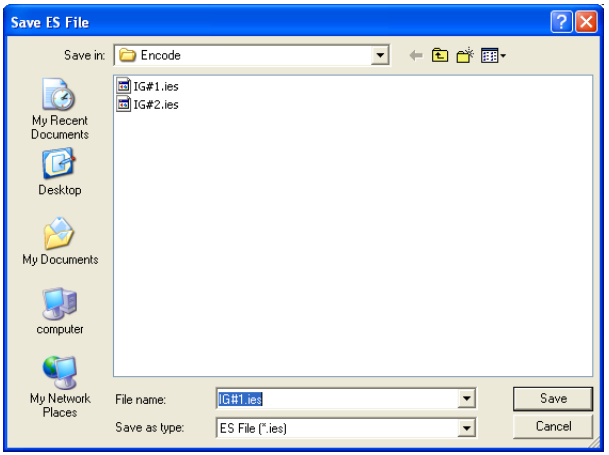
Since the creation of any IG effect changes the data associated with an IG, you need to re-encode it.

To Re-encode an IG to include IG effect data:

1 In the Data Tree, right-click the IG to which you have added the IG effect, and choose Encode from the shortcut menu.

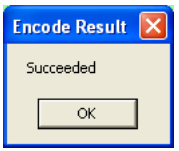
Note: Any IG that is unencoded shows this icon in the Data Tree:

2 Choose Edit > Encode > Build. The Save ES File dialog box appears.



3 Click Save. The program asks you to confirm the re-encode process.

4 Click Yes. Scenarist encodes the IG. An Encode Result dialog box appears.



5 Click OK. The IG is encoded with the IG effect data.

Note: Any IG that is encoded shows this icon in the Data Tree:

12 Presentation graphics

This chapter documents how to add presentation graphics to Scenarist BD projects. It includes the following topics:

- "Presentation graphics" on page 254
- "Creating presentation graphics" on page 254

Presentation graphics

Presentation graphics are most often used for full-color subtitle images; they also can be used for titles, labels, other information, or purely decorative graphics. Either PNGs or TIFFs can be used as assets for presentation graphics.

The HDMV format supports to 256 colors (8 bits) for presentation graphics. Images must be saved as indexed. HDMV also supports alpha channel (variable transparency) information with PNG files; however, it stores alpha information in the palette, per color (rather than per pixel).

Creating presentation graphics

Presentation graphics (PGs) are created in Scenarist BD with virtual graphic assets. The following sections document how to create PG virtual assets, define their content, encode them, and add them to Clips:

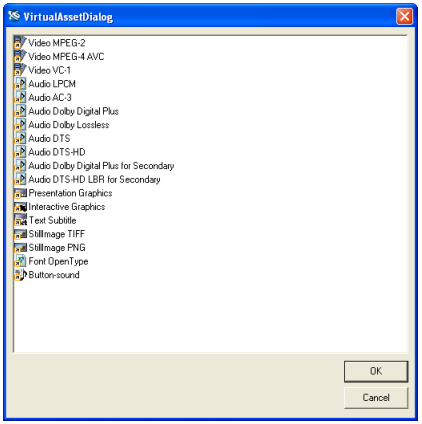
- “Creating PG virtual assets” on page 255
- “Defining content for PG virtual assets” on page 259
- “Encoding PGs” on page 266
- “Adding PGs to projects” on page 268

Note: It is also possible to create PGs in Adobe Photoshop. Then you can use Scenarist Designer PS (a Photoshop plug-in) to optimize them, and export them in a format that can be imported directly into Scenarist BD. For more information, see “Importing/updating Designer PS files” on page 325; also, see the *Scenarist Designer PS User Guide*.

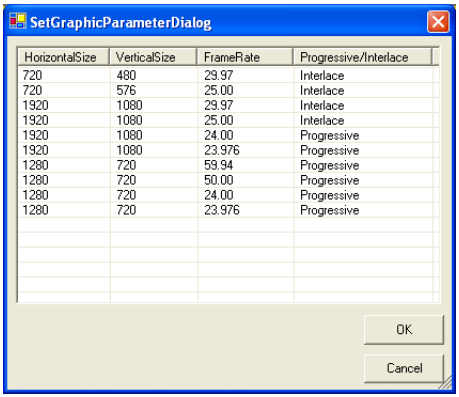
Creating PG virtual assets

To create a PG virtual graphic:

1 In the Data Tree, right-click the folder to which you will add the PG virtual asset, and choose New > Virtual Asset from the shortcut menu. The Virtual Asset dialog box appears.



2 Select Presentation Graphics, then click OK. The Set Graphic Parameter dialog box appears.

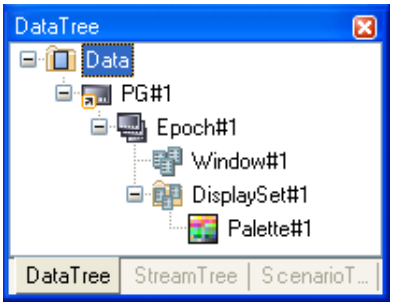


3 Select the parameters used by the video or still image background of the presentation graphic, then click OK. A PG virtual asset is added to the Data Tree.

4 To rename the PG virtual asset, click its name twice so it becomes selected, enter the new name, and press Enter.

5 If appropriate, change the Language Code for the virtual asset (see “Changing the Language Code for assets” on page 77).

6 Add additional required components to the PG virtual asset. When completed, it should look like this:



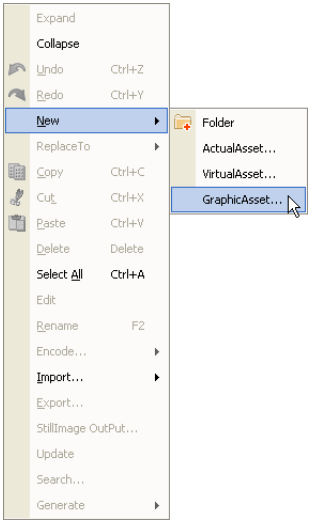
- Right-click the PG virtual asset and choose New > Virtual Asset from the shortcut menu. In the Virtual Asset dialog box, select Epoch and click OK. An Epoch object is added to the PG virtual asset, and a Window object is added automatically to the Epoch.
- Expand the PG virtual asset, right-click the Epoch object, and choose New > Virtual Asset from the shortcut menu. In the Virtual Asset dialog box, select Display Set and click OK. A Display Set object is added to the Epoch, and a Palette object is added automatically to the Display Set.

Creating PG virtual assets with a single operation

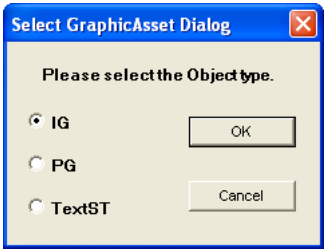
Instead of building PG virtual assets step by step, as described in “Creating PG virtual assets,” above, it is possible to create them using a single operation.

To create a PG virtual assets with a single operation:

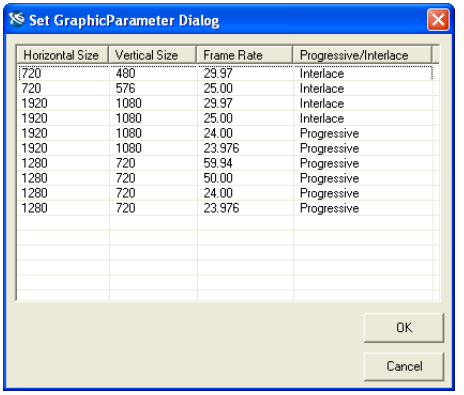
1 In the Data Tree, right-click the folder to which you will add the PG virtual asset, and choose New > Graphic Asset from the shortcut menu.



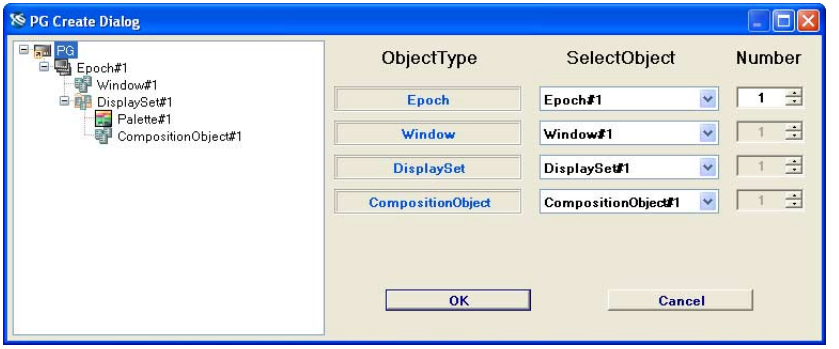
2 The Select Graphic Asset dialog box appears.



3 Select PG, then click OK. The Set Graphic Parameter dialog box appears.

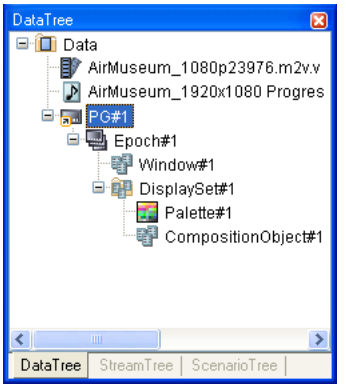


4 Select the parameters used by the video or still image background of the PG, then click OK. The PG Create dialog box appears.



5 To add objects to the PG virtual asset, select the type of object in the tree view (or the folder to which a new object will belong), then select the number of objects you want using the arrows in the appropriate Number field.

6 When you are finished defining your PG virtual asset, click OK. The PG appears in the Data Tree.

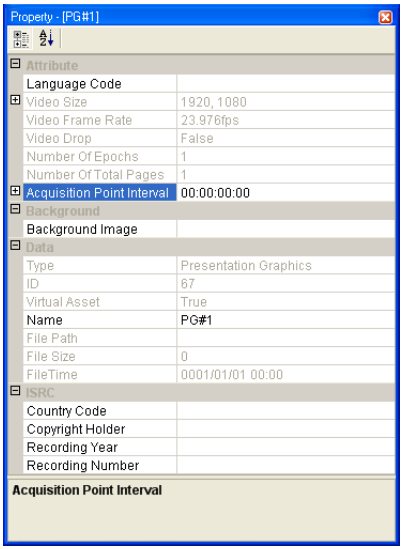


Defining content for PG virtual assets

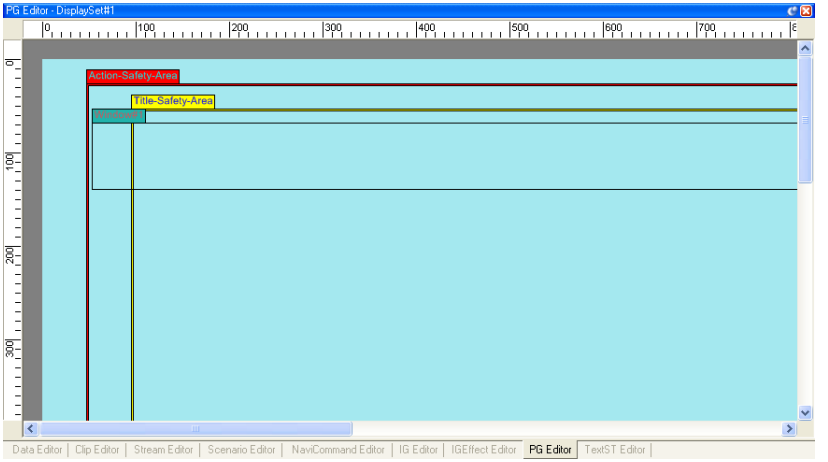
To define content for a PG virtual asset:

1 Expand the PG virtual asset in the Data Tree so all of its components are visible.

2 In the Data Tree, select the PG virtual asset, then set the Acquisition Point Interval in the Properties window.



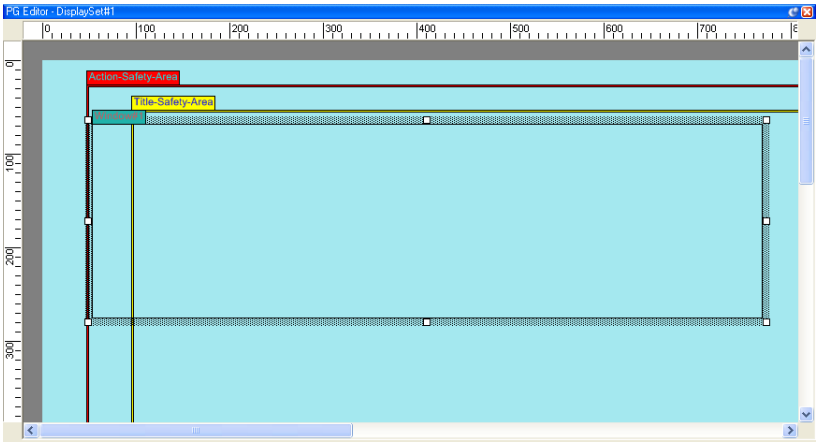
3 In the Data Tree, double-click the Display Set object for the PG virtual asset. The Window object that will display the presentation graphic appears in the PG Editor.



Note: The other two objects in the screen area of the PG Editor show the Title-Safe-Area and Action-Safe-Area of a television screen.

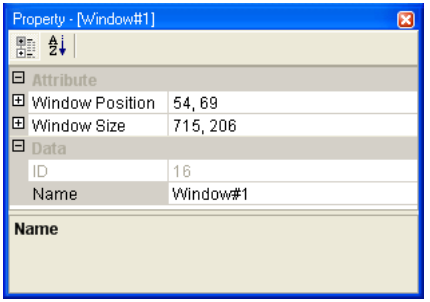
4 Set PG Window properties by doing one of the following:

- Move or resize the Window in the PG Editor.



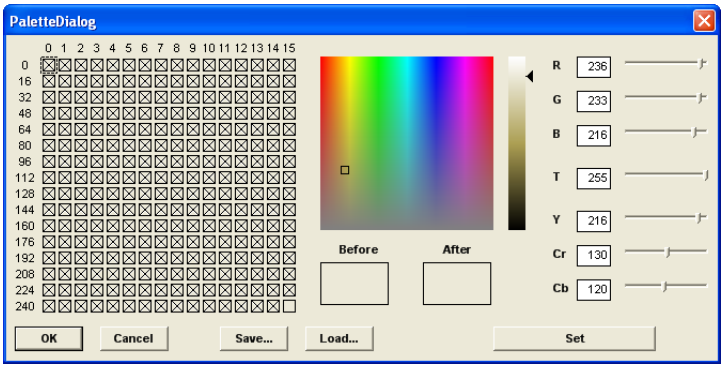
Note: You can use the Zoom buttons in the toolbar to display the entire screen area, so you have a better sense of the placement of the Window.

- In the Data Tree, select the Window object, then enter the Position and Size values in the Properties window.



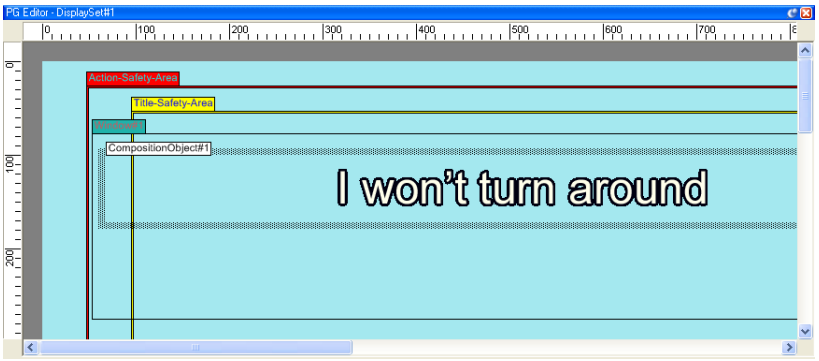
5 Set the palette for the PG virtual asset:

- In the Data Tree, double-click the Palette object for the PG virtual asset. The Palette dialog box appears.



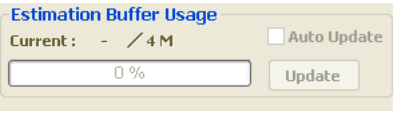
- Click Load. The Load File dialog box appears.
- Select the image file that will be referenced by the PG virtual asset, then click Open. Any other image files in one Display Set must share this same palette.
- Click OK to close the Palette dialog box.

6 Drag an image asset from the Data Tree onto the Window in the PG Editor. The image appears in the Window.



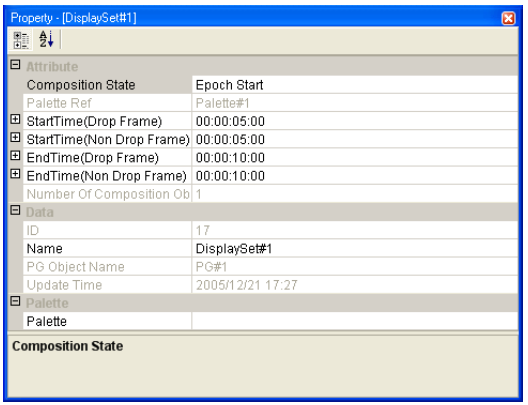
A Composition Object is added under the Display Set object in the Data Tree.

Note: In the newest version of Scenarist BD (version 4.5 Final), the PG Editor includes an Estimation Buffer Usage box:



This gives an estimate of the buffer usage required by the PG.

7 In the Data Tree, select the Display Set object, then select or enter appropriate values in the Properties window.



- **Epoch Flag** sets the composition state for the Display Set; options are:

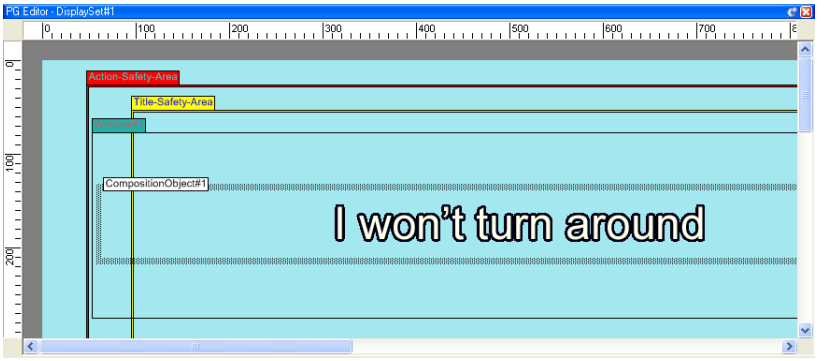
  - **Normal Case** means that the Display Set contains only elements that are changed from the previous composition.
  - **Acquisition Point** means that the Display Set contains all elements needed to display the next composition.

- **Epoch Start** indicates the start of a new Epoch; the Display Set contains all elements needed to display the next composition.
- **Epoch Continue** means that the Epoch may be continued across into this graphics stream from the previous graphics stream when seamless connection conditions apply. The Display Set contains all elements needed to display the next composition.

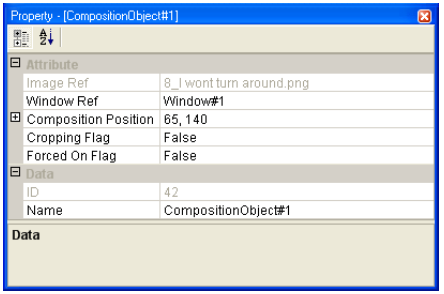
- **Start Time (Drop Frame)** sets the PTS to begin display of the PG (in drop-frame contexts).
- **Start Time (Non Drop Frame)** sets the PTS to begin display of the PG (in non-drop-frame contexts).
- **End Time (Drop Frame)** sets the PTS to end display of the PG (in drop-frame contexts).
- **End Time (Non Drop Frame)** sets the PTS to end display of the PG (in non-drop-frame contexts).

8 To change the position of the Composition Object, do one of the following:

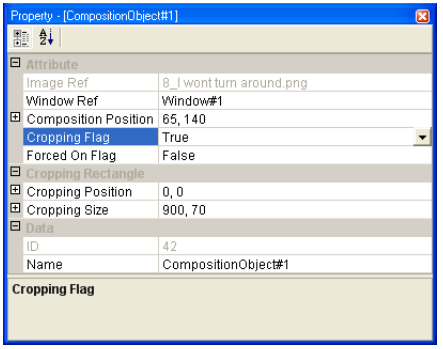
- Move the Composition Object to a new location in the PG Editor.



- In the Data Tree, select the Composition Object, then enter new Composition Position values in the Properties window.



9 To crop the Composition Object, click it the Data Tree, and set the Cropping Flag to True in the Properties window. Cropping Rectangle parameters appear.



Enter new values for Cropping Position and Cropping Size.

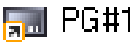
10 If appropriate, change the Forced On Flag value in the Composition Object Properties window from False to True.

Encoding PGs

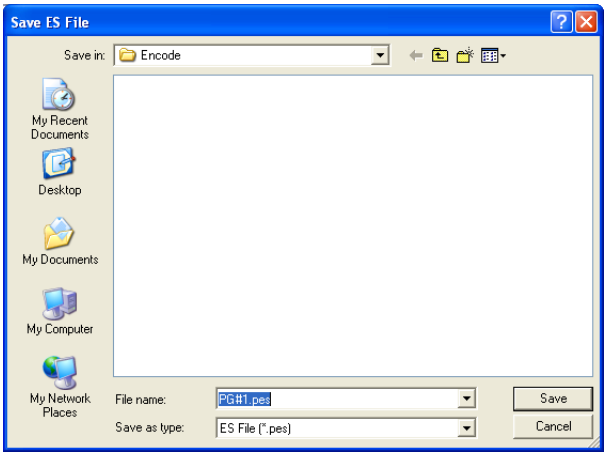
To encode a PG:

1 In the Data Tree, right-click the PG and choose Encode from the shortcut menu.

Note: Any PG that is unencoded shows this icon in the Data Tree:

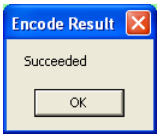


2 Choose Edit > Encode > Build. The Save ES File dialog box appears.



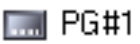
Note: The dialog box automatically selects the Encode folder path that was defined when you created the project.

3 Click Save. Scenarist BD encodes the PG. An Encode Result dialog box appears.



4 Click OK. The PG is encoded.

Note: Any PG that is encoded shows this icon in the Data Tree:



If the PG asset encodes successfully, you are ready to add it to a Clip.

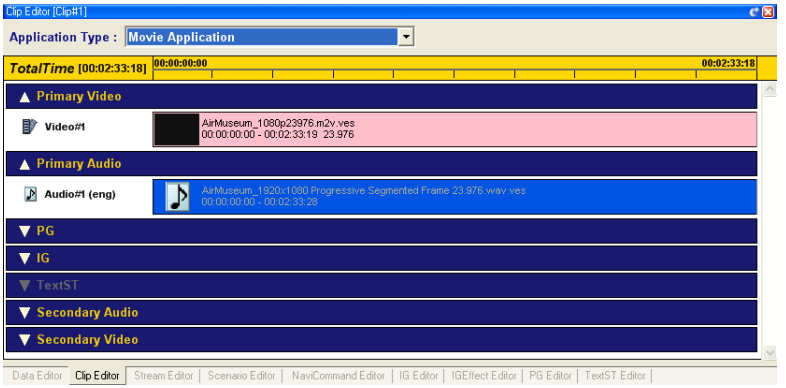
Note: The Encode > Rebuild option is available if you lose the ES (elementary stream) that is created when you encode a virtual asset. Scenarist BD maintains links to any still images used in the creation of virtual assets.

Adding PGs to projects

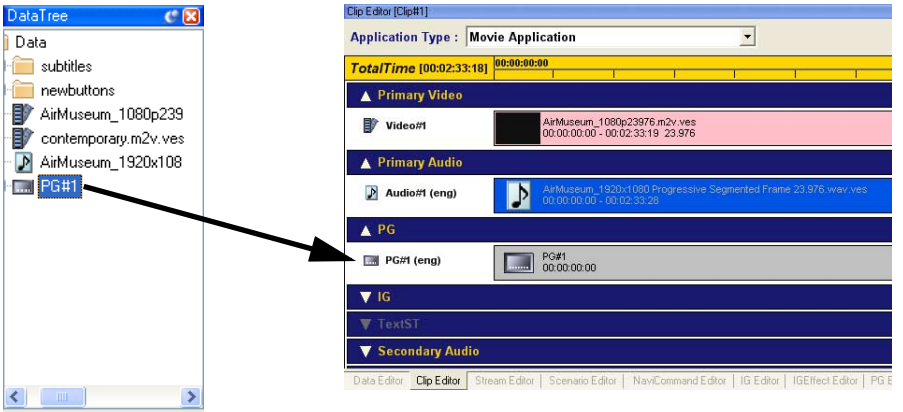
PGs are added to projects by including them in Clips.

To add a PG to a Clip:

1 In the Stream Tree, double-click the Clip to which you will add the PG. The Clip is displayed in the Clip Editor.



2 Drag the PG asset from the Data Tree onto the PG track in the Clip Editor. The presentation graphic is added to the Clip.



13 Importing subtitle sets (BDN import)

This chapter documents how to import sets of subtitle into Scenarist BD projects. It includes the following topics:

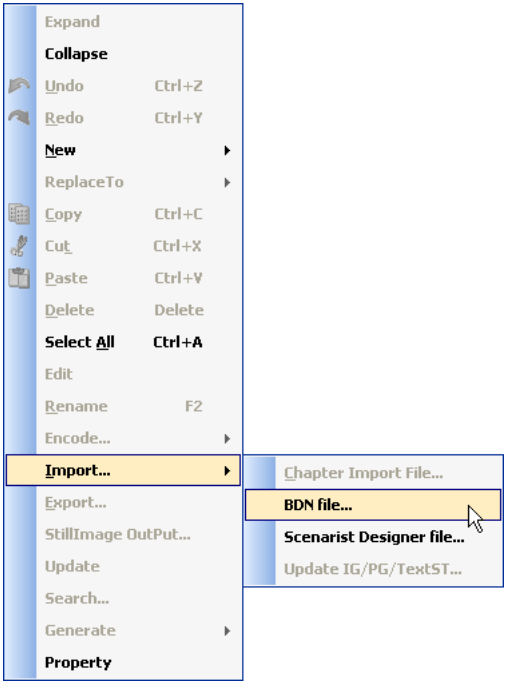
- "Importing sets of subtitles" on page 270
- "The PES Editor" on page 277
- "Importing multiple sets of subtitles" on page 288
- "Re-ordering PG streams" on page 298

Importing sets of subtitles

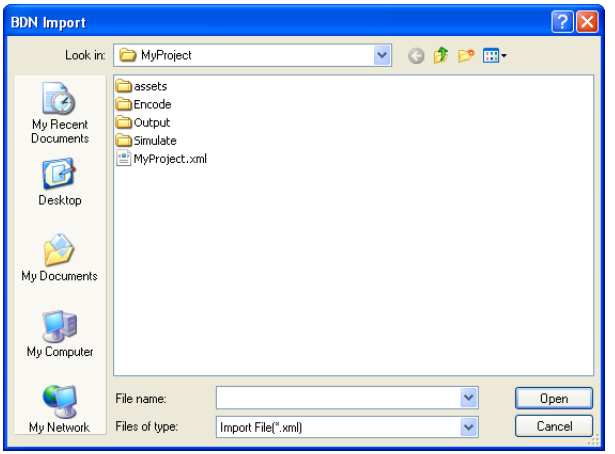
In many situations, you will need to incorporate sets of subtitles created by a third-party vendor into your project. These BDN imports contain all of the PG image files, plus a controlling BDN script (.xml) file. As part of the import process, Scenarist BD automatically parses the (.xml) file, creates the PG data structure, and encodes the PG. The subtitles are also auto-cropped during the import process, following the BDN spec.

To import a set of subtitles:

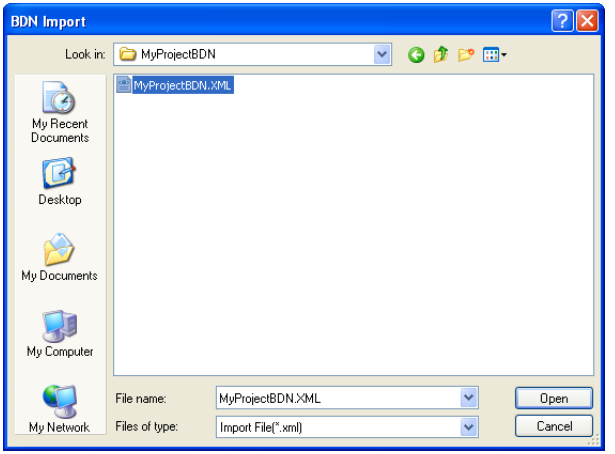
1 In the Data Tree, right-click the folder to which you will add the set of subtitles, and choose Import > BDN file from the shortcut menu.



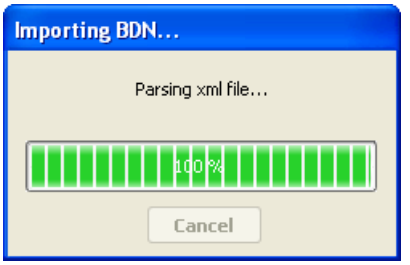
2 The BDN Import dialog box appears.



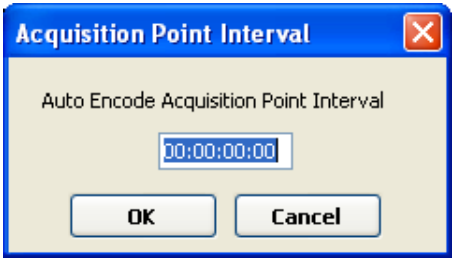
3 Locate the BDN script (.xml) file.



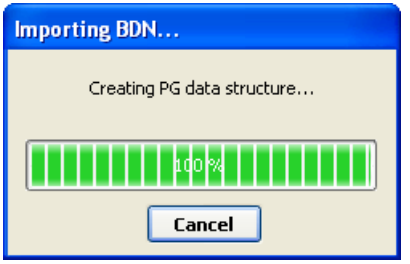
4 Select the file, and click Open. Scenarist BD begins the import process by parsing the BDN script (.xml) file. The program shows you the progress of the parsing operation.



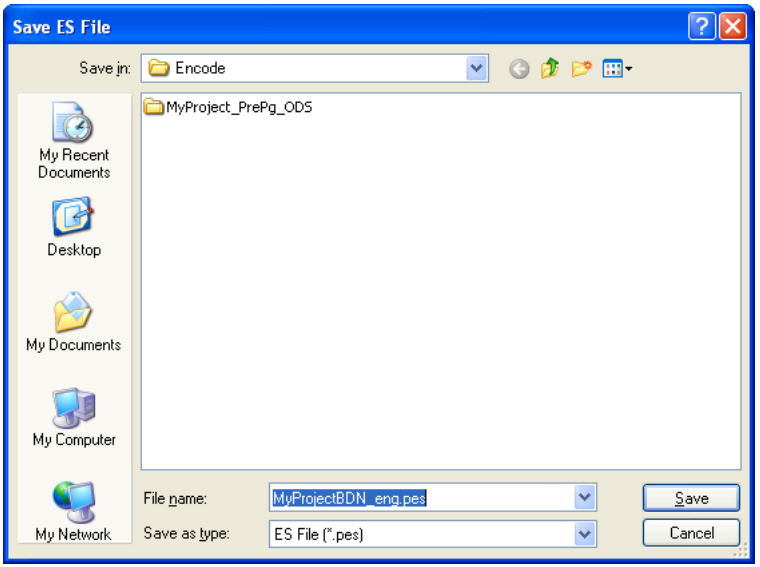
The Acquisition Point Interval dialog box appears.



5 Set the Auto Encode Acquisition Point interval to an appropriate value; then click OK. Scenarist BD begins creating the PG data structure. The program shows you the progress of the operation.

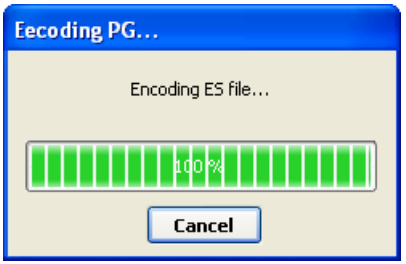


Once the PG data structure is created, Scenarist BD prepares to encode the PG. The Save ES File dialog box appears.

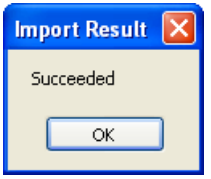


Note: The dialog box automatically selects the Encode folder path that was defined when you created the project.

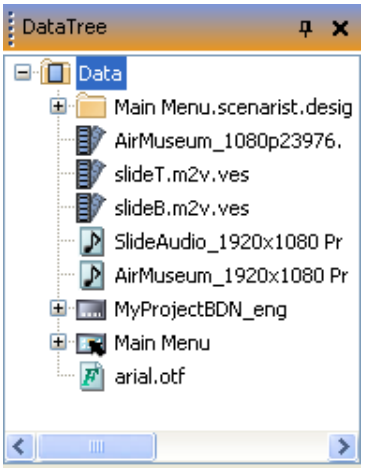
6 Click Save. Scenarist BD encodes the BDN import PG. The program shows you the progress of the encode operation.



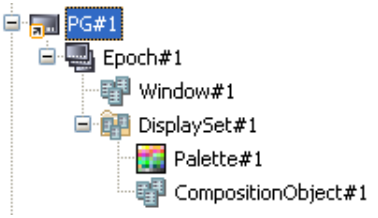
7 An Encode Result dialog box appears.



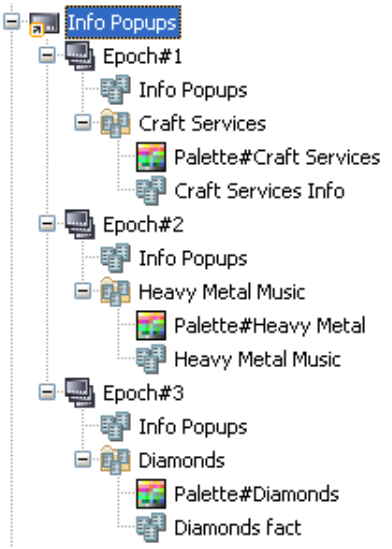
8 Click OK. The BDN import subtitle set appears as a PG in the Data tree.



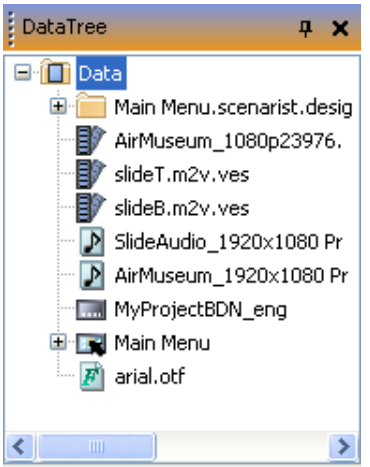
The Data Tree displays BDN import PGs in a different way than it displays PGs created in Scenarist BD, or PGs created using Scenarist Designer PS and then imported into Scenarist BD. For PGs created in Scenarist BD, the Data Tree displays all of the objects under the PG:



The same is true for PGs created in Scenarist Designer PS and imported into Scenarist BD:

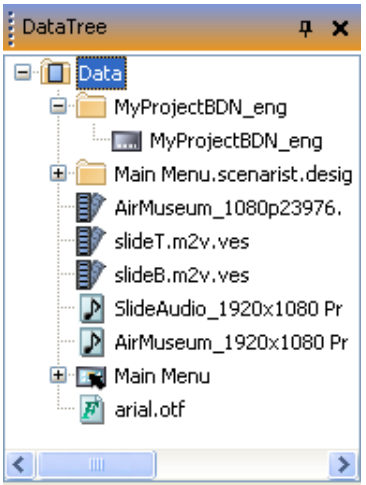


However, for BDN import PGs, the Data Tree displays only the parent object PG. If you click on the plus sign to the left of the BDN import PG to expand the view, the plus sign simply disappears:



In order to view and work with the objects under a BDN import PG, Scenarist BD provides a PES Editor, which is described in “The PES Editor” on page 277, below. You can use the PES Editor to see all of the objects under the BDN import PG, view the Composition Objects in the Display Sets, change the timecode for the Display Sets, or create new Epochs and Display Sets. The PES Editor is only for use with BDN import PGs; to work with Scenarist BD PGs or Scenarist Designer import PGs, use the PG Editor.

Note: If you open an older project (one created using a version of Scenarist BD earlier than 4.5 Final) that includes a BDN import PG, the parent folder for that earlier import appears in the Data Tree; however, if you expand the view, only the PG icon appears below the folder:



For BDN imports performed with the current version of Scenarist BD (4.5 Final), the Data Tree shows only the PG object (as shown in step 8 on page 274, above).

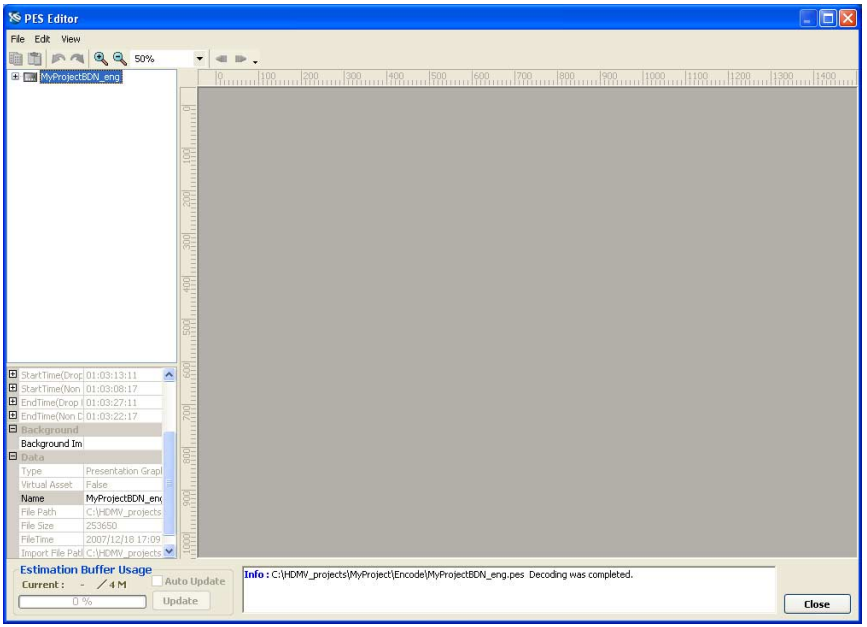
The PES Editor

Scenarist BD includes a PES Editor, which allows you to view and work with the objects under BDN import PGs. You can also use the PES Editor to add new Epochs and Display Sets to your BDN import PGs (for information see “Adding new Epochs / Display Sets to BDN import PGs” on page 281).

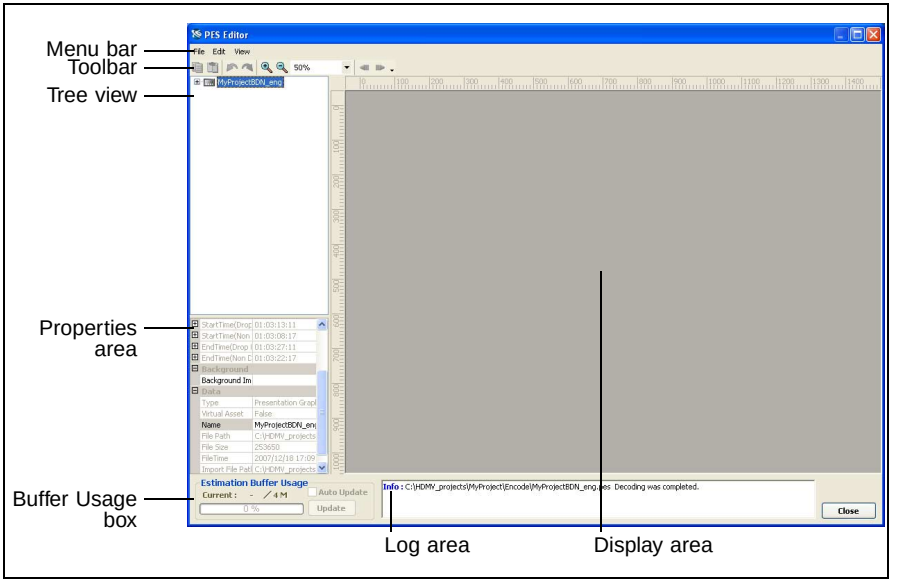
Note: The PES Editor is available only for BDN import PGs; to work with PGs created using Scenarist BD or Scenarist Designer PS, use the PG Editor.

To work with the PES Editor:

1 In the Data Tree, either double-click the BDN import PG object, or right-click the object and select Edit from the shortcut menu. The PES Editor appears.



The PES Editor window has a number of areas and features:



The PES Editor

Menu bar Contains the File, Edit, and View menus.

Toolbar Contains various toolbar buttons and options to facilitate your work with the PES Editor.

Tree view Functions like the Data Tree in Scenarist BD; allows you to view all of the objects under the BDN import PG.

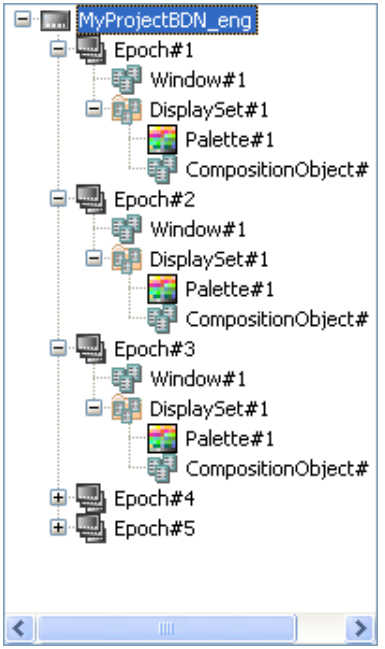
Properties area Functions like the Properties window in Scenarist BD; allows you to change certain properties of the PG objects.

Buffer Usage box Gives an estimate of the buffer usage required by the BDN import PG.

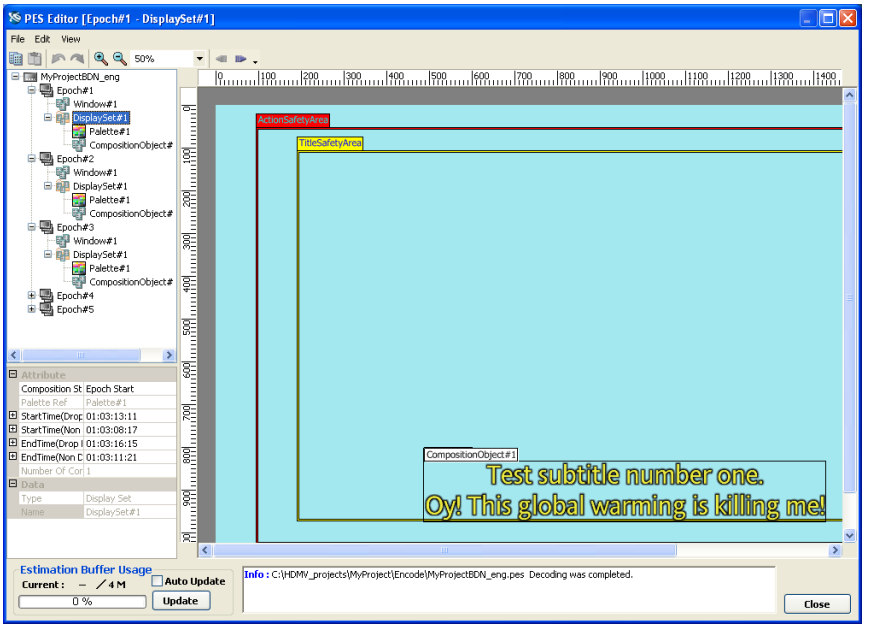
Log area Functions like the Log window in Scenarist BD; displays status and error message for a range of PES Editor operations.

Display area Shows the Display Set selected in the Tree view.

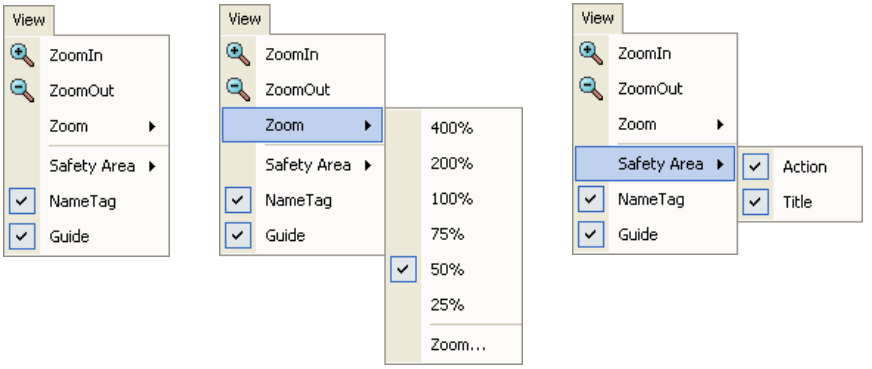
2 Expand the BDN import PG object in the Data Tree so that its components are visible.



3 Select a Display Set in the Tree view. The Display Set you selected appears in the Display area.



4 Use the options in the View menu as appropriate to adjust the Display area.

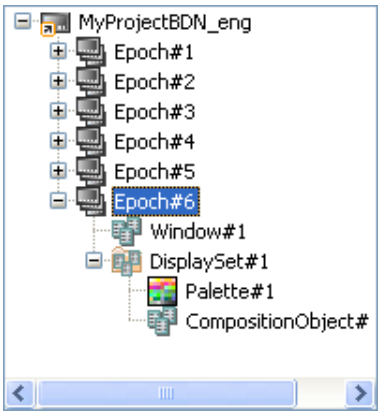


5 If appropriate, use the Properties area to change the timecode of the selected Display Set.

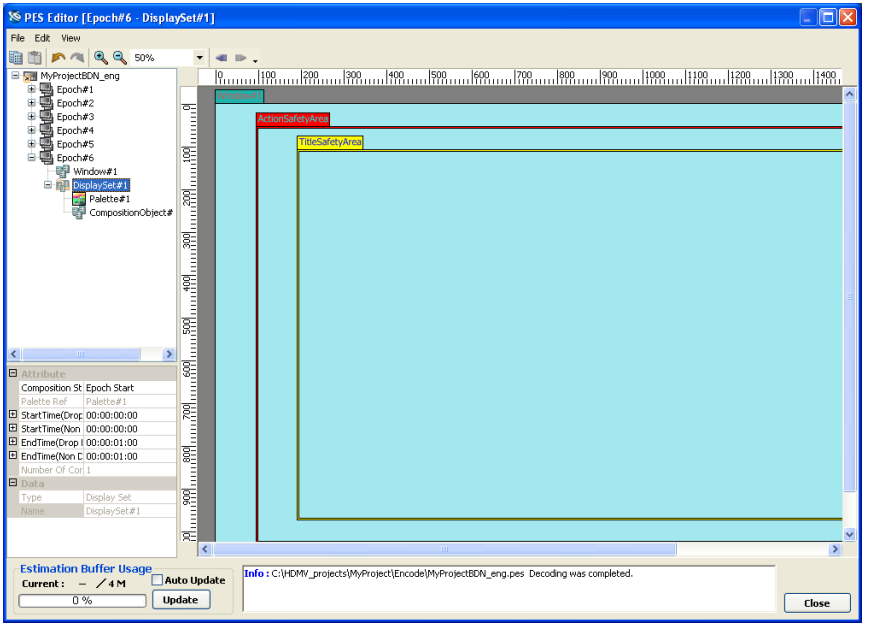
Adding new Epochs / Display Sets to BDN import PGs

To add a new Epoch and Display Set to your BDN import PG:

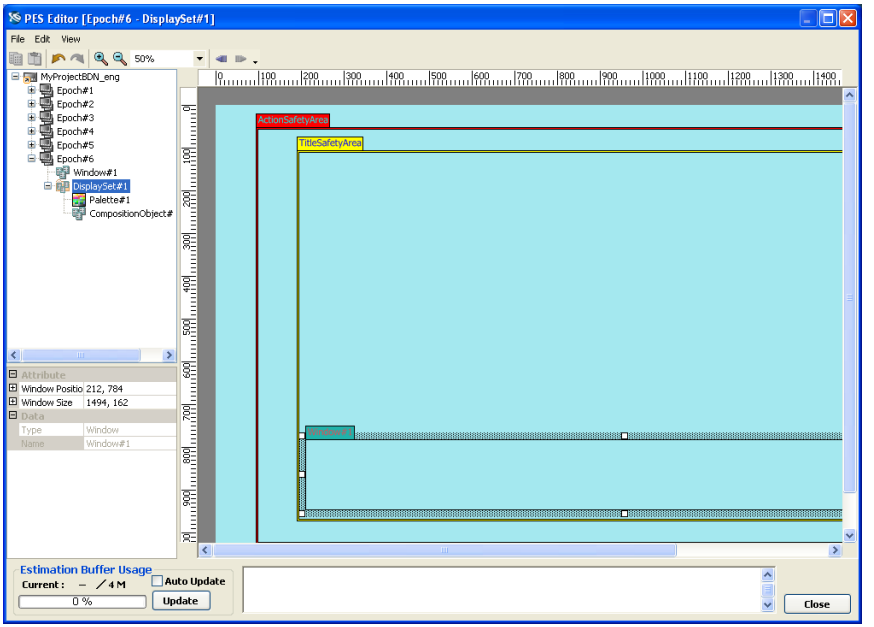
1. In the Tree view, right-click the BDN import PG object, and choose New > Epoch from the shortcut menu. A new Epoch appears in the Tree view.
2. Right-click the new Epoch, and choose New > DisplaySet from the shortcut menu.
3. Expand the view of the Epoch to show the new Display Set. Right-click the Display Set, and choose New > CompositionObject from the shortcut menu.
4. Expand the view to display all of the objects under the new Epoch.



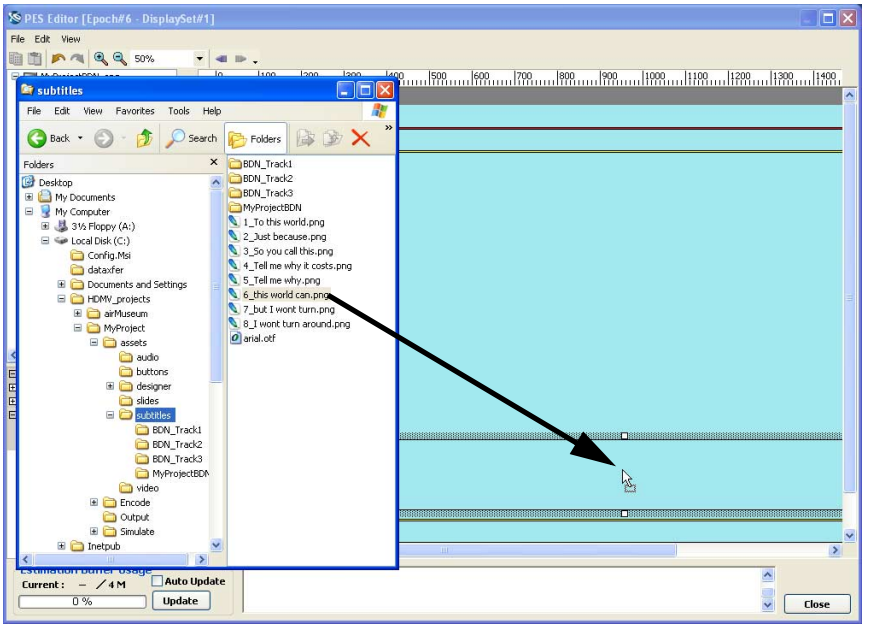
5 In the Tree view, select the Display Set. It appears in the Tree view.



6 If appropriate, use the Display area to change the size and placement of the Window object.

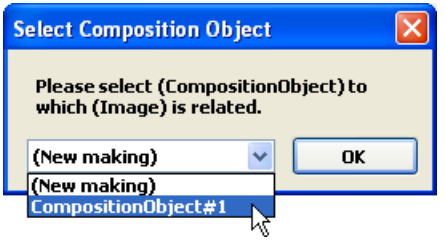


7 Use Windows Explorer to locate an appropriate subtitle image; then drag and drop it into the Window object in the Display area.



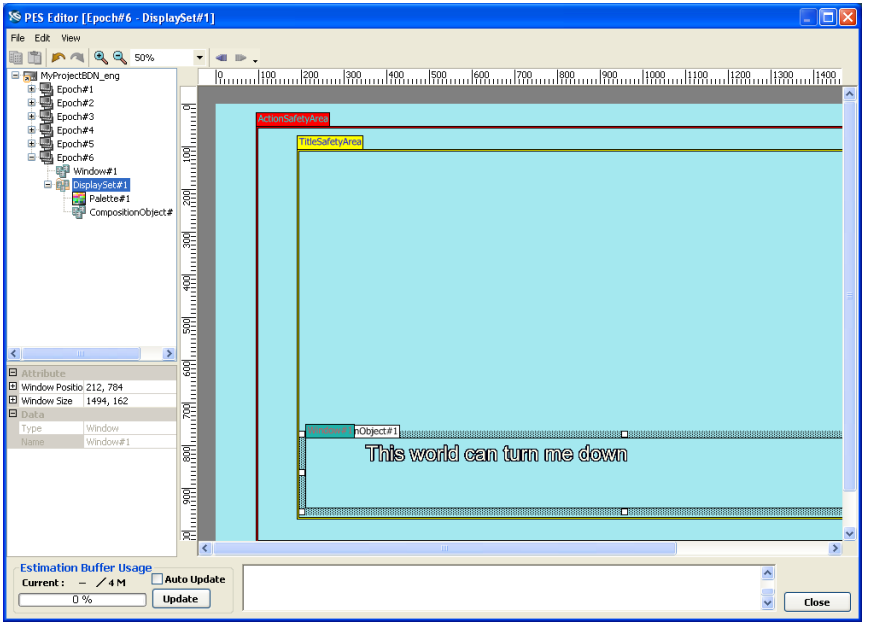
The Select Composition Object dialog box appears.

8 Select CompositionObject#1 from the drop-down list.



9 Click OK. If the subtitle image you selected uses a different palette than the other Composition Object images in the BDN import PG, the program asks you to confirm replacement of the palette.

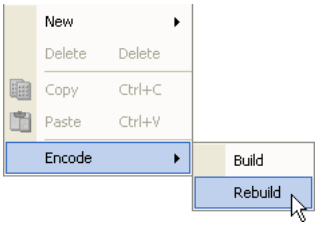
10 Click Yes or No, as appropriate. The subtitle image you selected appears as a Composition Object in the Display area



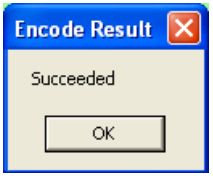
11 In the Properties view, adjust the timecode values for your new Display Set, so that they don't interfere with other events in the BDN import PG.

Since you have changed the BDN import PG by adding a new Epoch and Display Set, it is no longer encoded.

12 In the Data tree, right-click the BDN import PG object, and choose Encode > Rebuild from the shortcut menu.

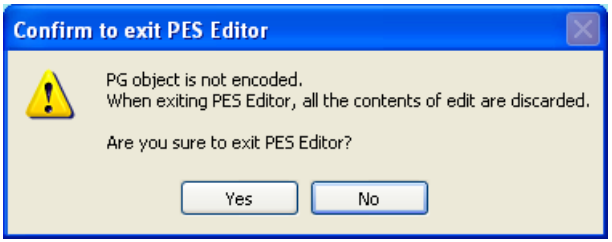


The PES Editor encodes the changed PG. An Encode Result dialog box appears.



13 Click OK. The BDN import PG is encoded.

Note: If you attempt to exit the PES Editor without encoding a changed BDN import PG, the program gives you a warning message:



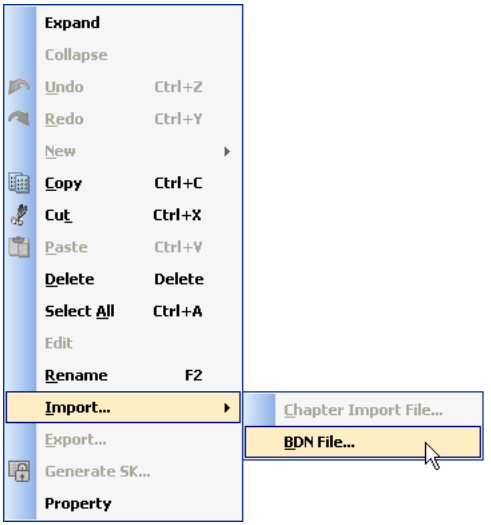
If you click Yes, all changes you have made to the BDN import PG will be lost.

Importing multiple sets of subtitles

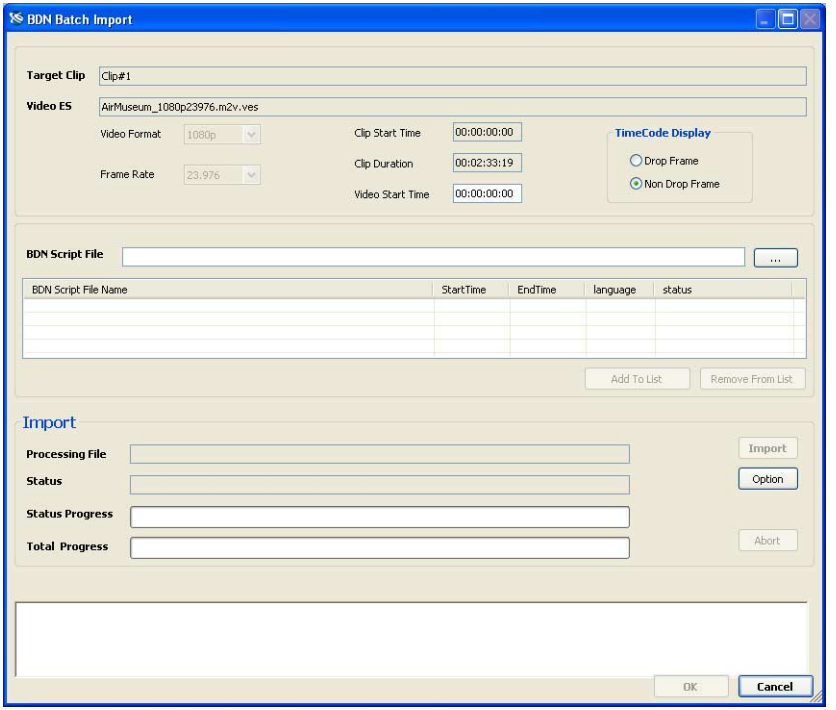
To provide subtitles in a number of languages for your projects, you will need to incorporate multiple sets of subtitles, again created by a third-party vendors. For each subtitle language, there will be a BDN import folder that contains all of the PG image files, plus a controlling BDN script (.xml) file. To accommodate these multiple subtitle sets, Scenarist BD offers a BDN batch import function.

To perform a BDN batch import:

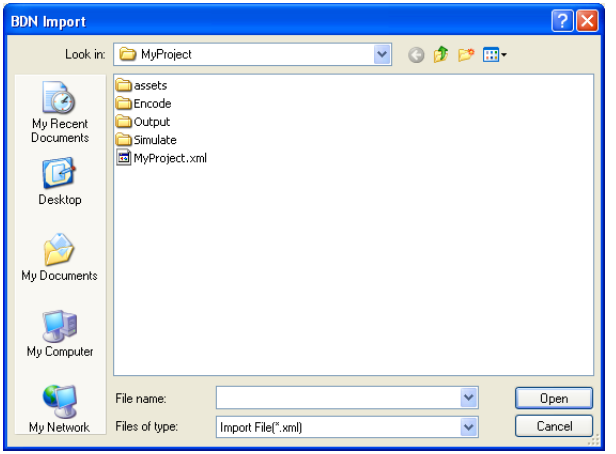
1 In the Stream Tree, right-click the Clip to which you will add the multiple sets of subtitles, and choose Import > BDN file from the shortcut menu.



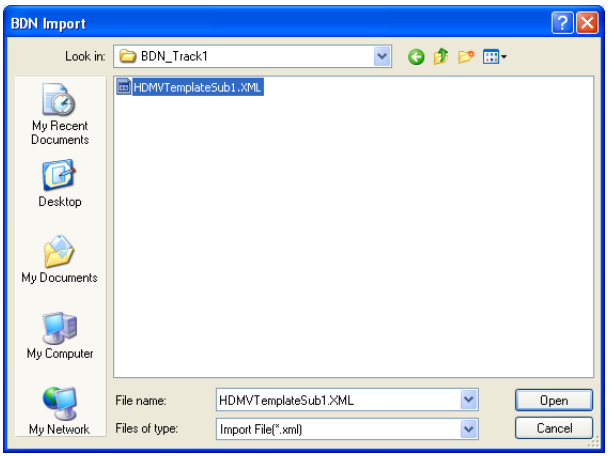
2 The BDN Batch Import window appears.



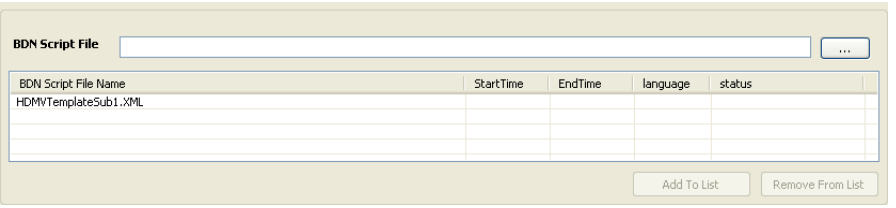
3 Click the Browse button to the right of the BDN Script File window. The BDN Import dialog box appears.



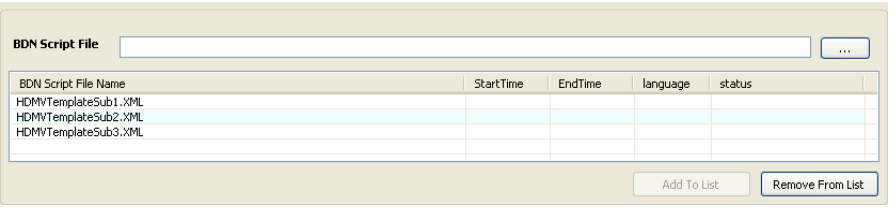
4 Locate the first BDN script (.xml) file.



5 Click Open. The first script file appears in the BDN Script File Name list.

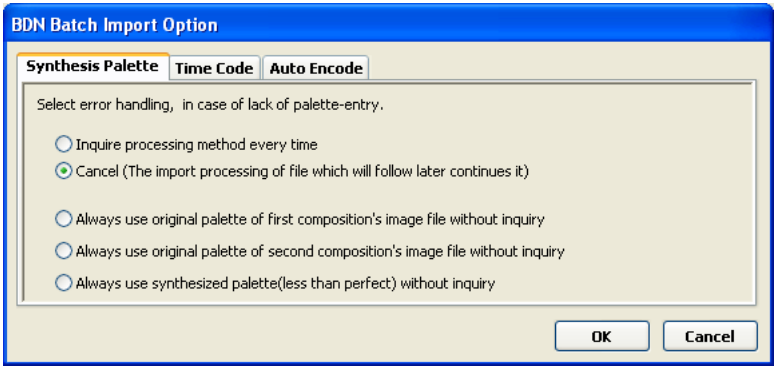


6 Using the procedure outlined in steps 3-5, above, locate and open all of the BDN scripts that are part of your batch import.



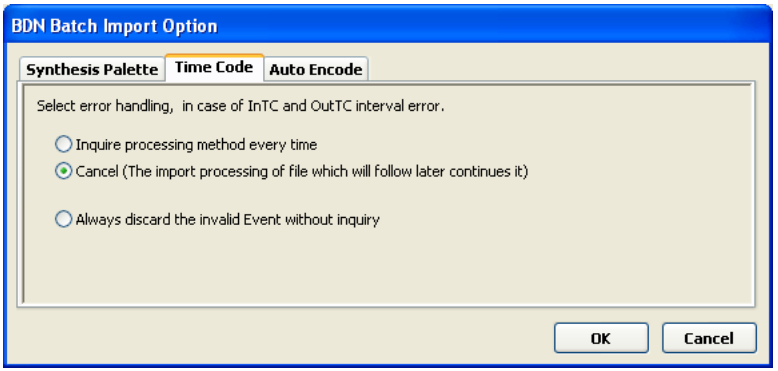
Note: You can also drag and drop BDN scripts directly into the BDN Script File Name list area.

7 Click Option. The BDN Batch Import Option dialog box appears, with the Synthesis Palette tab showing.



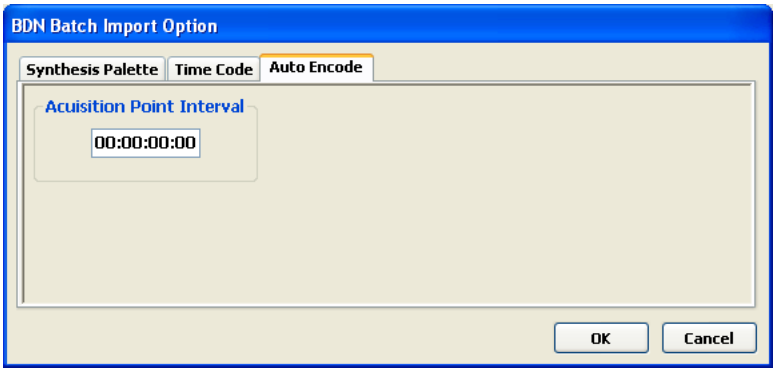
8 Using the radio buttons, select the appropriate error handling method.

9 Click the Time Code tab.



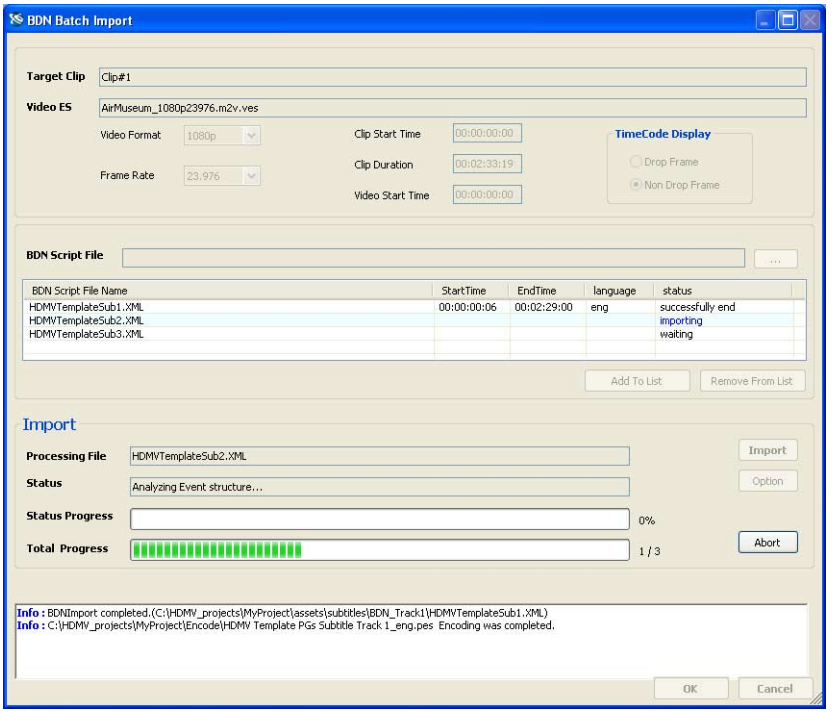
10 Using the radio buttons, select the appropriate error handling method.

11 Click the Auto Encode tab.

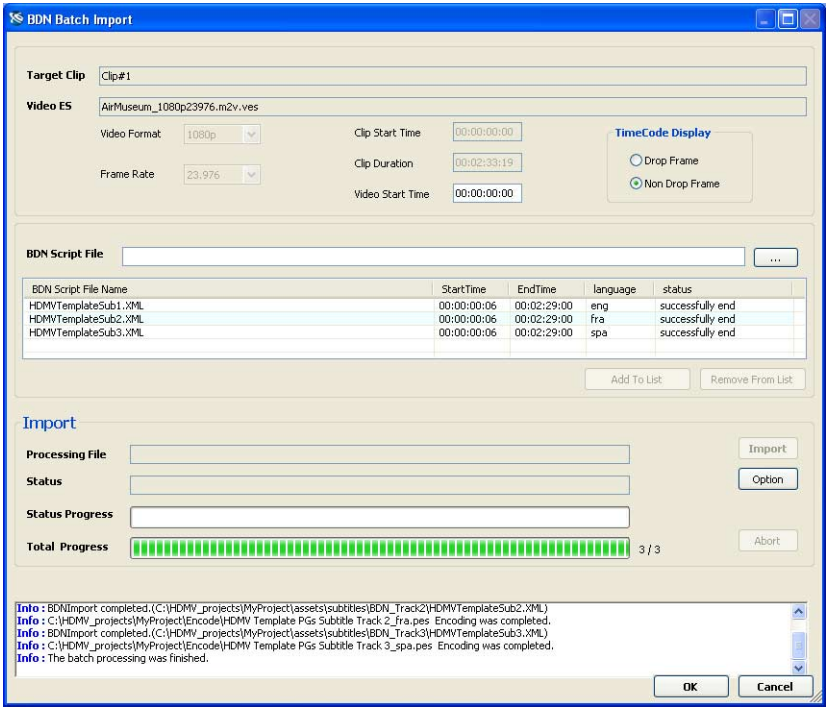


12 Set the appropriate Acquisition Point Interval; then click OK. The BDN Batch Import Option dialog box closes.

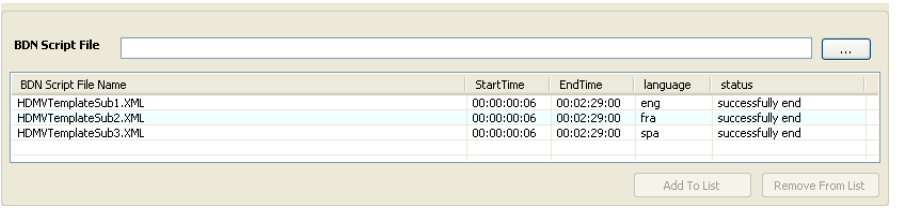
13 Click Import. The program starts the import process; the BDN Batch Import window shows the progress of the import.



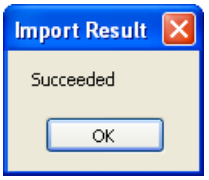
14 The BDN Batch Import window shows when the import process is complete.



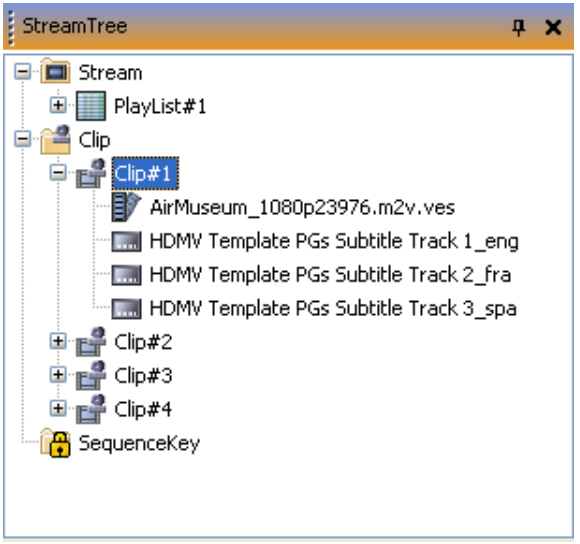
The BDN Script File Name List shows the Start Time, End Time, language, and import status for each BDN script file.



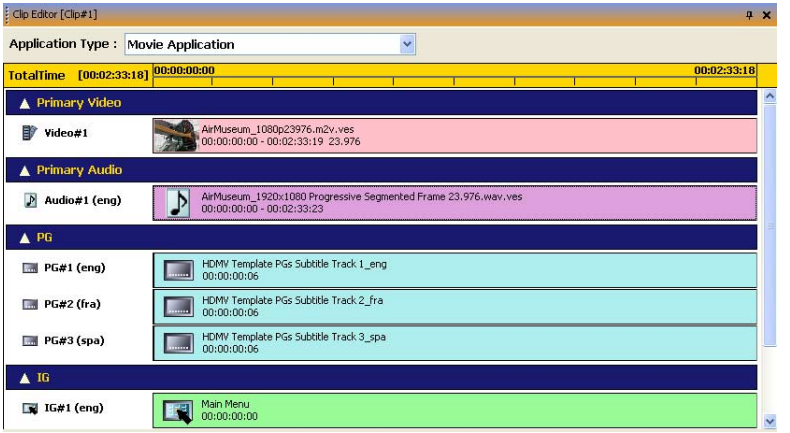
15 Click OK. The BDN Batch Import import closes. In Scenarist BD, an import result dialog box appears.



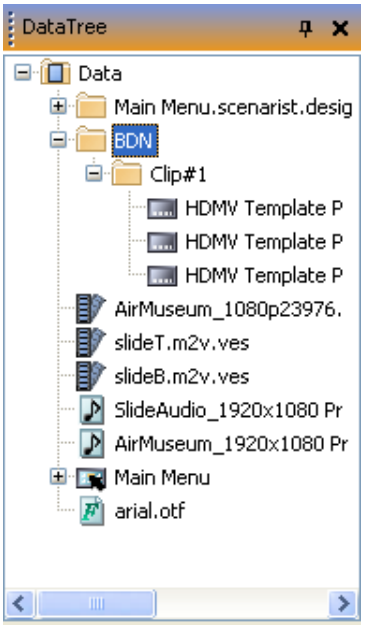
Click OK. The BDN import PGs appear in the Stream Tree.



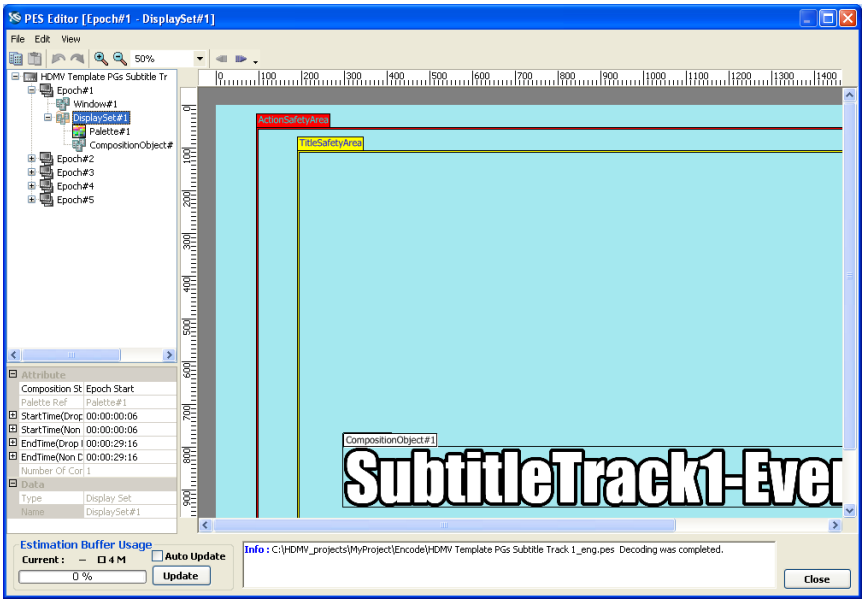
The BDN import PGs also appear in the Clip Editor.



16 To view the objects under any of the BDN import PGs, locate them in the Data Tree.



17 In the Data Tree, either double-click a BDN import PG object, or right-click an object and select Edit from the shortcut menu. The PES Editor appears.

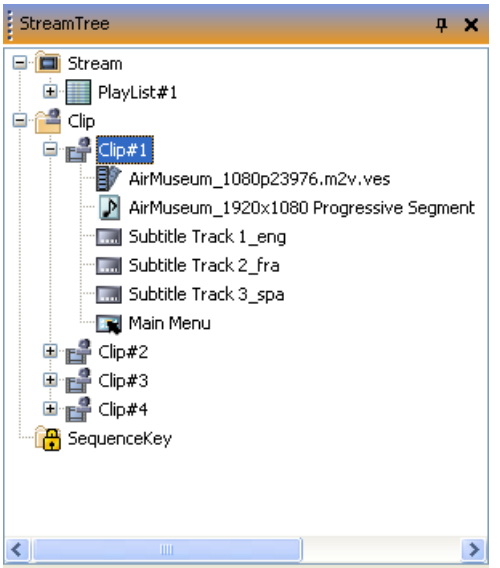


Re-ordering PG streams

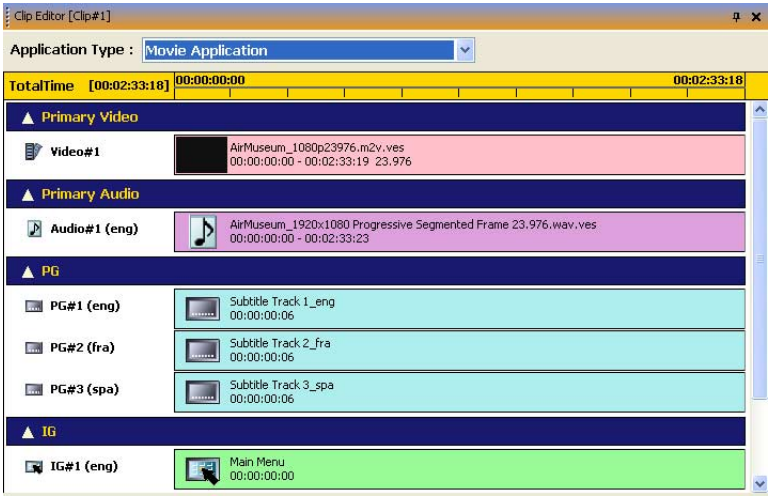
Scenarist BD allows you to change the order of BDN import PG streams by simply dragging and dropping them in the Stream Tree. The application automatically changes the numbering of the PG streams, and updates any links to the PG streams.

To re-order BDN import PG streams:

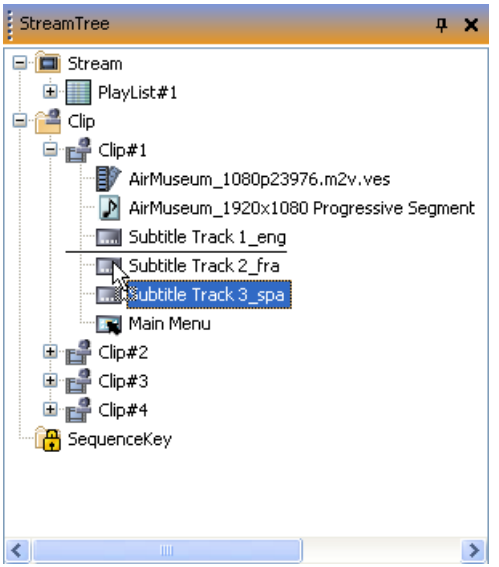
1 In the Tree area, select the Stream Tree, and expand the view of the Clip that contains the PG stream you want to re-order.



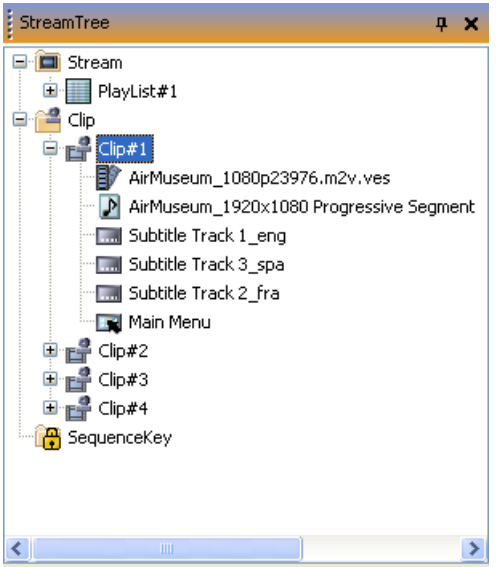
2 In the Editor area, display the Clip in the Clip Editor.



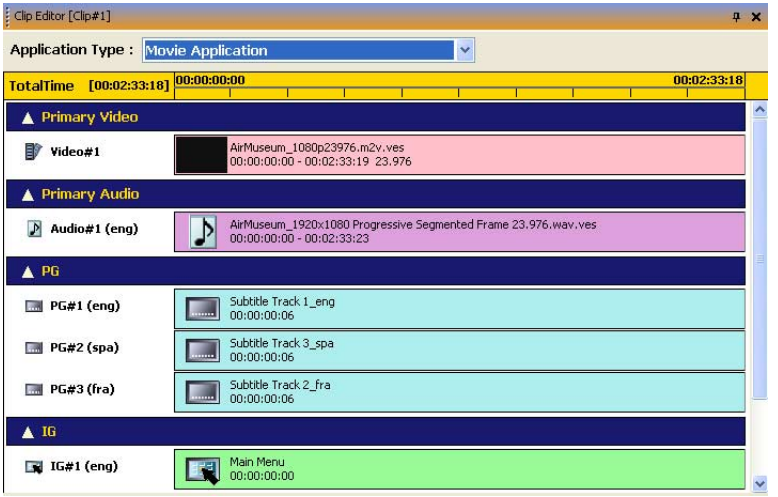
3 In the Stream Tree, drag the PG stream you want to re-order to its new location.



The moved PG stream appears in its new location in the Stream Tree.



4 The Clip Editor shows the new ordering (and numbering) of the PG streams.



14 Text-based subtitles

This chapter documents how to add text-based subtitles to Scenarist BD projects. It includes the following topics:

- "Text-based subtitles" on page 302
- "Creating Text-based subtitles" on page 303

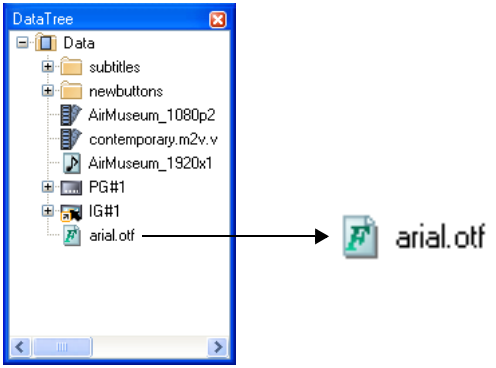
Text-based subtitles

The HDMV format offers two ways of providing subtitles, presentation graphics (see Chapter 12, “Presentation graphics”) and text-based subtitles. Unlike PGs, text-based subtitles are not converted into graphics. They are stored outside of the main audio-visual stream, and therefore don’t affect the bandwidth or quality of the main movie at all; instead, they are added to the main AV stream when the BD player runs the title. This division of storage locations makes it possible to provide more subtitle languages on a movie without taking up a lot of disc space or compromising video quality.

Although they are not converted into graphics, text-based subtitles are positioned and sized in text regions on the presentation (graphic) plane. Within each text region are text boxes, which use text “styles” to determine font type, size, color, text flow, and line spacing. Text styles can be changed character by character, and can be altered over time to create fade-in or fade-out effects.

Font assets

In order to create text-based subtitles, you need to import one or more OpenType fonts to your project (see “Importing assets” on page 77). Once they are imported to your project, font assets appear in the Data Tree:



Creating Text-based subtitles

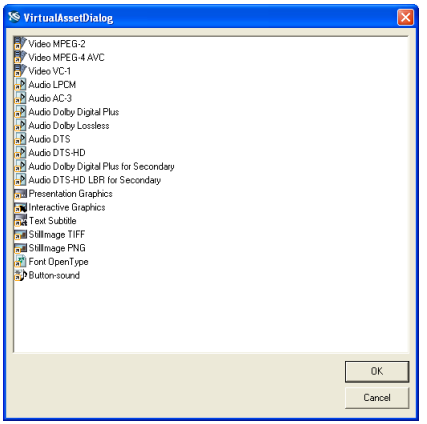
Text-based subtitles (Text STs) are created in Scenarist BD using virtual assets. The following sections document how to create text-based subtitle virtual assets, define their content, encode them, and add them to projects:

- "Creating Text ST virtual assets" on page 303
- "Defining content for Text ST virtual assets" on page 308
- "Encoding Text STs" on page 319
- "Adding Text STs to projects" on page 320

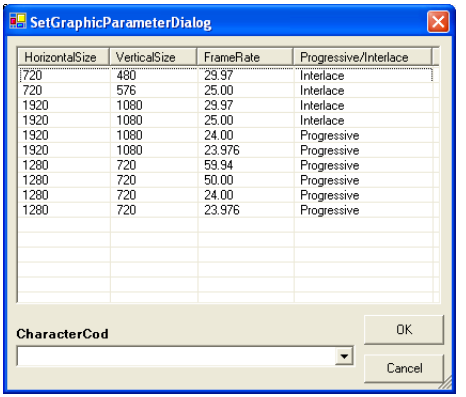
Creating Text ST virtual assets

To create a Text ST virtual asset:

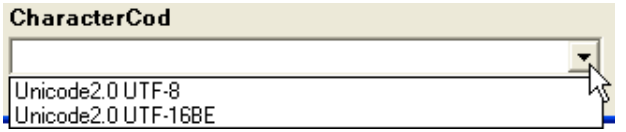
1 In the Data Tree, right-click the folder to which you will add the Text ST virtual asset, and choose New > Virtual Asset from the shortcut menu. The Virtual Asset dialog box appears.



2 Select Text Subtitle, then click OK. The Set Graphic Parameter dialog box appears.



3 Select the parameters used by the video or still image background of the Text ST; then select the Character Coding using the drop-down list.

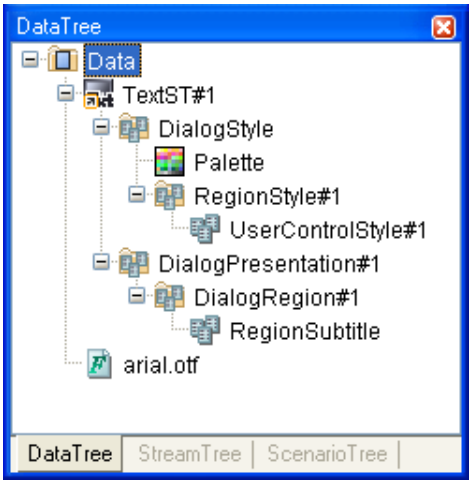


4 Click OK. A Text ST virtual asset is added to the folder. A Dialog Style object is added automatically to the Text ST, and a Palette object is added automatically to the Dialog Style.

5 To rename the Text ST virtual asset, click its name twice so it becomes selected, enter the new name, and press Enter.

6 If appropriate, change the Language Code for the virtual asset (see “Changing the Language Code for assets” on page 77).

7 Add additional required components to the Text ST virtual asset. When completed, it should look like this:



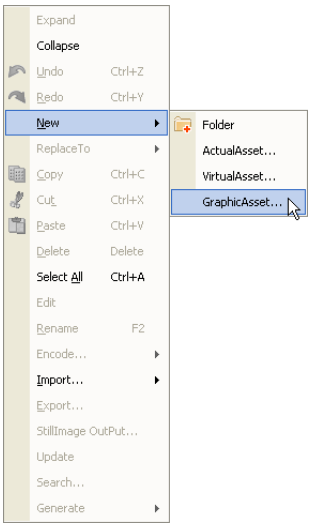
- Expand the Text ST virtual asset, right-click the Dialog Style object, and choose New > Virtual Asset from the shortcut menu. In the Virtual Asset dialog box, select Region Style and click OK. A Region Style object is added to the Dialog Style.
- Right-click the Region Style object and choose New > Virtual Asset from the shortcut menu. In the Virtual Asset dialog box, select User Control Style and click OK. A User Control Style object is added to the Region Style.
- Right-click the Text ST virtual asset and choose New > Virtual Asset from the shortcut menu. In the Virtual Asset dialog box, select Dialog Presentation and click OK. A Dialog Presentation object is added to the Text ST.
- Right-click the Dialog Presentation object and choose New > Virtual Asset from the shortcut menu. In the Virtual Asset dialog box, select Dialog Region and click OK. A Dialog Region object is added to the Dialog Presentation, and a Region Subtitle object is added automatically to the Dialog Region.

Creating Text ST virtual assets with a single operation

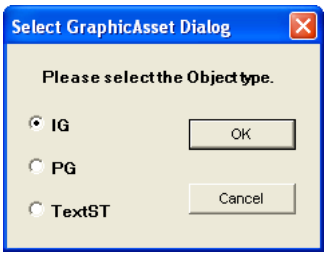
Instead of building Text ST virtual assets step by step, as described in "Creating Text ST virtual assets," above, it is possible to create them using a single operation.

To create a Text ST virtual assets with a single operation:

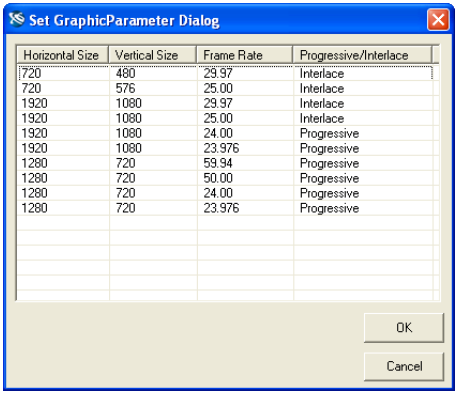
1 In the Data Tree, right-click the folder to which you will add the Text ST virtual asset, and choose New > Graphic Asset from the shortcut menu.



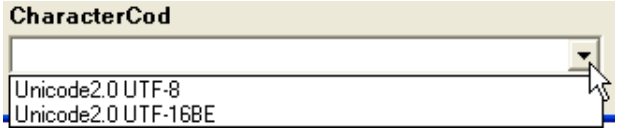
2 The Select Graphic Asset dialog box appears.



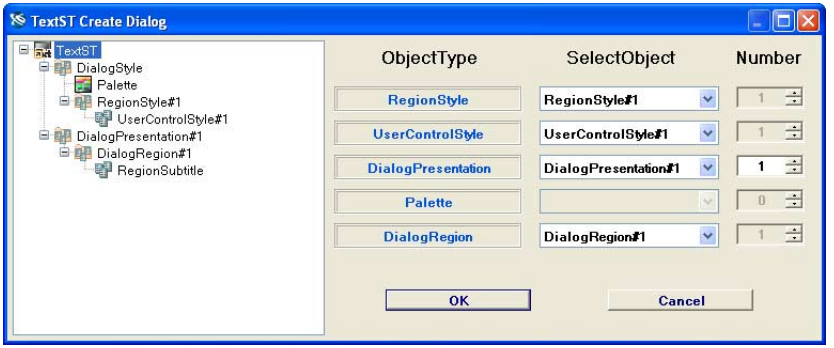
3 Select Text ST, then click OK. The Set Graphic Parameter dialog box appears.



4 Select the parameters used by the video or still image background of the Text ST; then select the Character Coding using the drop-down list.

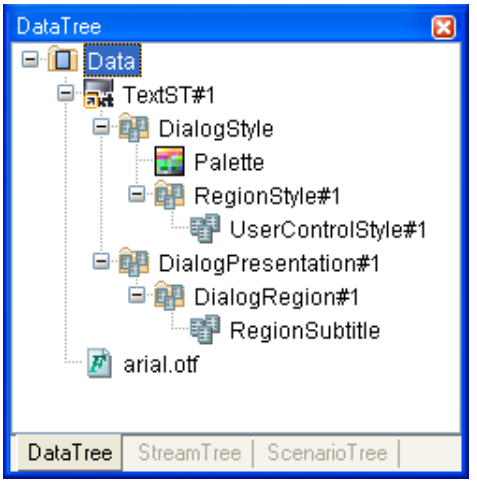


5 click OK. The Text ST Create dialog box appears.



6 To add objects to the Text ST virtual asset, select the type of object in the tree view (or the folder to which a new object will belong), then select the number of objects you want using the arrows in the appropriate Number field.

7 When you are finished defining your Text ST virtual asset, click OK. The Text ST appears in the Data Tree.

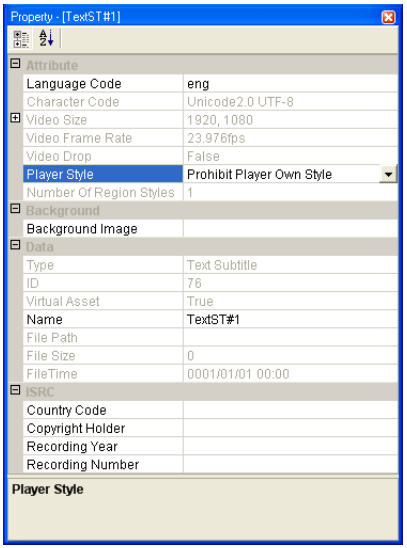


Defining content for Text ST virtual assets

To define content for a Text ST virtual asset:

1 Expand the Text ST virtual asset in the Data Tree so all of its components are visible.

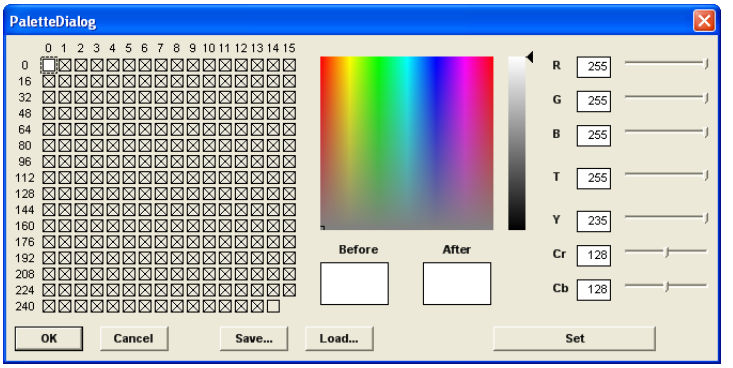
2 In the Data Tree, select the Text ST virtual asset, then select an appropriate Player Style value in the Properties window.



- **Permit Player Own Style** (default) allows a BD player to generate its own style for Text STs in addition to the author-defined sets.
- **Prohibit Player Own Style** blocks a BD player from generating a Text ST style.

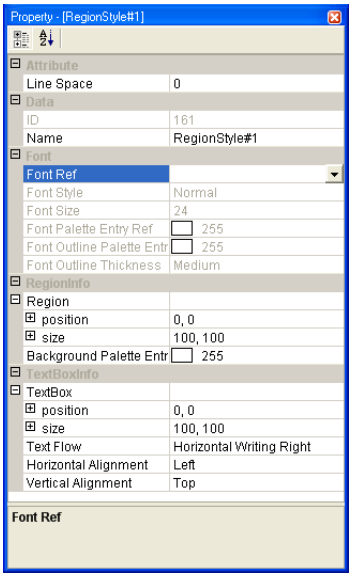
3 Set the palette for the Dialog Style object:

- In the Data Tree, double-click the Palette under the Dialog Style object. The Palette dialog box appears.



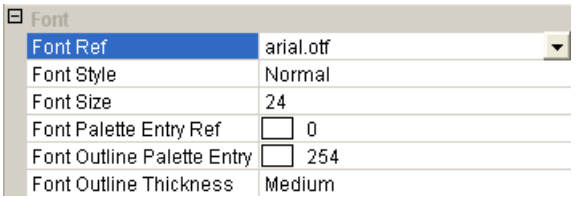
- In the Palette dialog box, click Load.
- Select the image file that uses your shared palette, then click Open.
- Click OK to close the Palette dialog box.

4 In the Data Tree, select the Region Style object, then select or enter appropriate values in the Properties window.

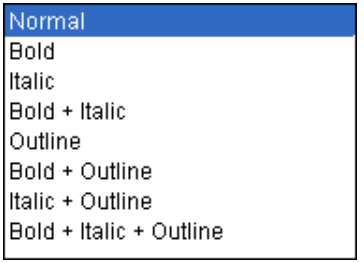


- **Line Space** sets the distance (in pixels) between two adjacent baselines.
- **Font Ref** selects the reference font from the set of font assets in the Data Tree.

Note: Once you select a Font Ref, the rest of the Font area becomes active:

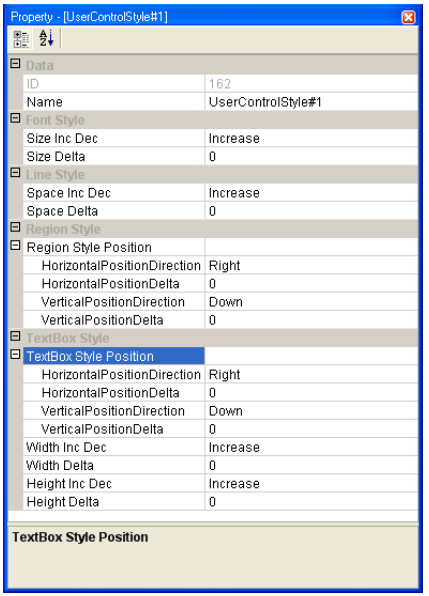


- **Font Style** sets the font weight; options are:



- **Font Size** sets the font point size (in pixels); default is 24.
- **Font Palette Entry Ref** sets the default color for the font.
- **Font Outline Palette Entry Ref** sets the default color for the font outline.
- **Font Outline Thickness** sets the size of the font outline; options are Thin, Medium, and Thick.
- **Region position** sets the X and Y axes (in pixels) for the text region.
- **Region size** sets the width and height (in pixels) for the text region.
- **Background Palette Entry Ref** sets the default color for the text region.
- **Text Box position** sets the X and Y axes (in pixels) for the text box.
- **Text Box size** sets the width and height (in pixels) for the text box.
- **Text Flow** sets the flow of text in the text box; options are Horizontal Writing Right, Horizontal Writing Left, and Vertical Writing.
- **Horizontal Alignment** sets the horizontal alignment of text in the text box; options are Left, Center, and Right.
- **Vertical Alignment** sets the vertical alignment of text in the text box; options are Top, Middle, and Bottom.

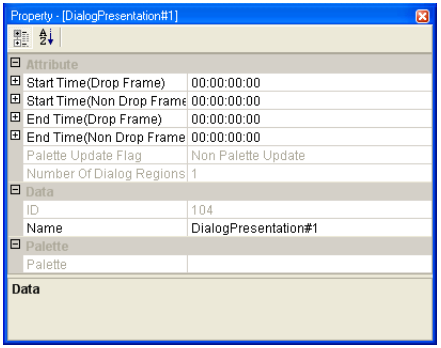
5 In the Data Tree, select the User Control Style object, then select or enter appropriate values in the Properties window.



- **Size Inc Dec** sets how the user can change the font size; options are Increase and Decrease.
- **Size Delta** sets how much the user can change the font size (in pixels). The final font size must be within the range 8–144.
- **Space Inc Dec** sets how the user can change the font spacing; options are Increase and Decrease.
- **Space Delta** sets how much the user can change the font spacing (in pixels).
- **Region Style Position:**
  - **Horizontal Position Direction** sets the horizontal direction in which the user can move the text region; options are Right and Left.

    - **Horizontal Position Delta** sets how much the user can change the horizontal position of the text region (in pixels).
    - **Vertical Position Direction** sets the vertical direction in which the user can move the text region; options are Down and Up.
    - **Vertical Position Delta** sets how much the user can change the vertical position of the text region (in pixels).
- **Text Box Style Position:**
    - **Horizontal Position Direction** sets the horizontal direction in which the user can move the text box; options are Right and Left.
    - **Horizontal Position Delta** sets how much the user can change the horizontal position of the text box (in pixels).
    - **Vertical Position Direction** sets the vertical direction in which the user can move the text box; options are Down and Up.
    - **Vertical Position Delta** sets how much the user can change the vertical position of the text box (in pixels).
- **Width Inc Dec** sets how the user can change the width of the text box; options are Increase and Decrease.
- **Width Delta** sets how much the user can change the width of the text box (in pixels).
- **Height Inc Dec** sets how the user can change the height of the text box; options are Increase and Decrease.
- **Height Delta** sets how much the user can change the height of the text box (in pixels).

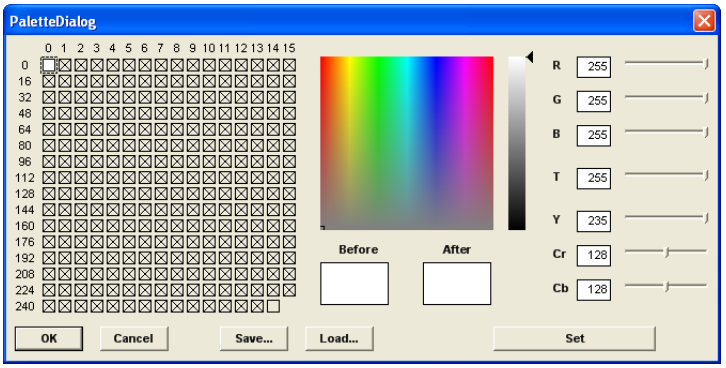
6 In the Data Tree, select the Dialog Presentation object, then select or enter appropriate values in the Properties window.



- **Start Time (Drop Frame)** sets the PTS to begin display of the Text ST (in drop-frame contexts).
- **Start Time (Non Drop Frame)** sets the PTS to begin display of the Text ST (in non-drop-frame contexts).
- **End Time (Drop Frame)** sets the PTS to end display of the Text ST (in drop-frame contexts).
- **End Time (Non Drop Frame)** sets the PTS to end display of the Text ST (in non-drop-frame contexts).

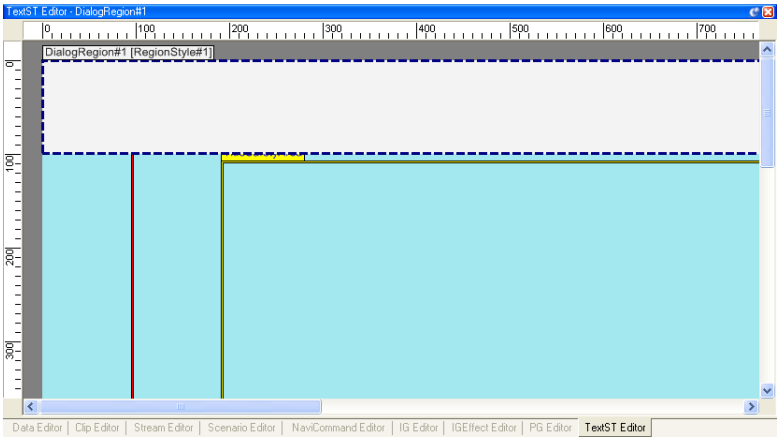
7 Set the palette for the Dialog Presentation object:

- In the Data Tree, double-click the Palette object under the Dialog Presentation object. The Palette dialog box appears.

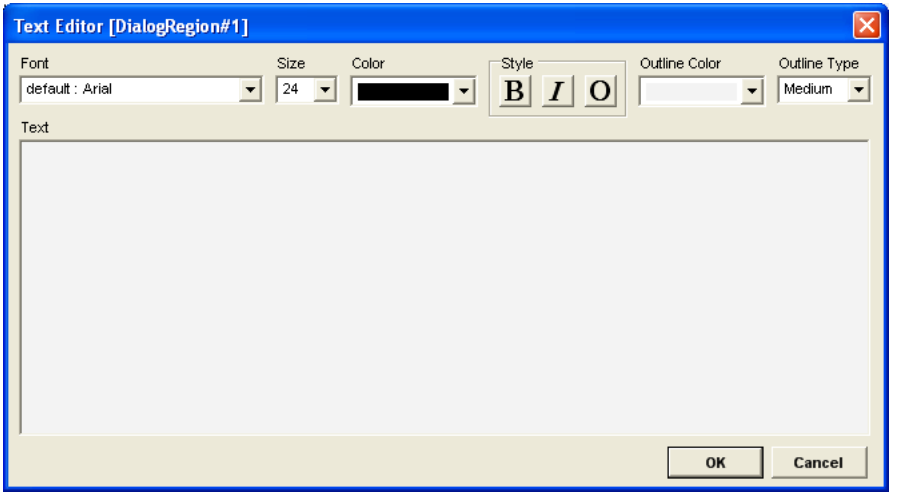


- In the Palette dialog box, click Load.
- Select the image file that uses your shared palette, then click Open.
- Click OK to close the Palette dialog box.

8 Double-click the Dialog Region object in the Data Tree. The Text ST Editor appears.

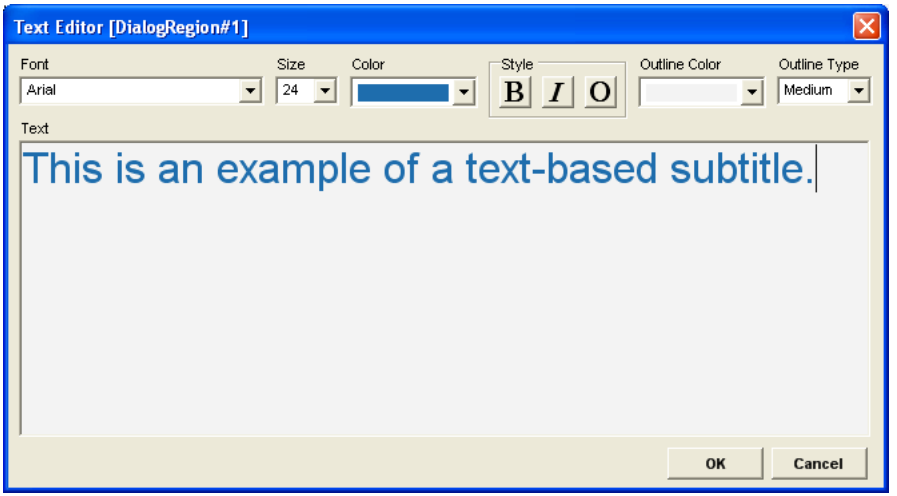


9 Double-click the Dialog Region rectangle. The Text Editor dialog box appears.

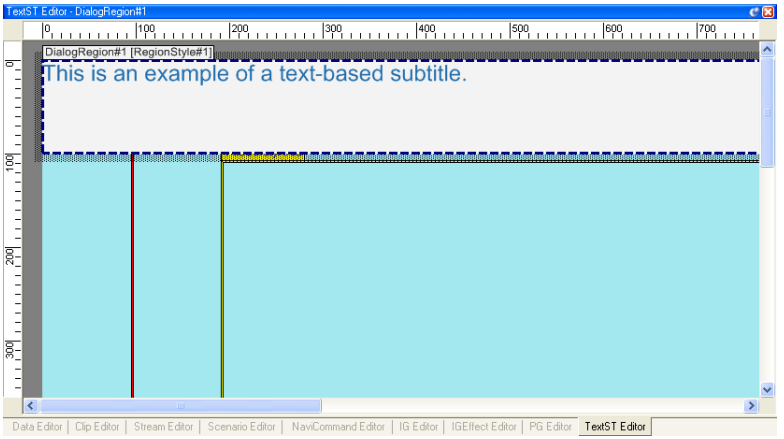


10 If appropriate, select new values for Font, Size, Color, Style, Outline Color, and Outline Type. The displayed values are those set in the Font area of the Region Style Properties window (see step 4 on page 311).

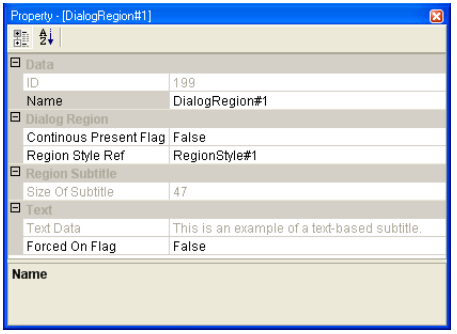
11 Type (or paste) the subtitle in the Text box (100 characters maximum).



12 Click OK. The subtitle appears in the Dialog Region rectangle of the Text ST Editor.



13 In the Data Tree, select the Dialog Region object, then select or enter appropriate values in the Properties window.



- **Continuous Present Flag** determines whether or not the Dialog Region is continuously present; options are True and False.
- **Region Style Ref** selects the reference Region Style from the set of defined Regions Styles in the Data Tree.

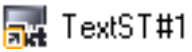
- Forced On Flag determines whether or not the text subtitle is forced on during the time frame defined by its PTS settings; options are True and False.

Encoding Text STs

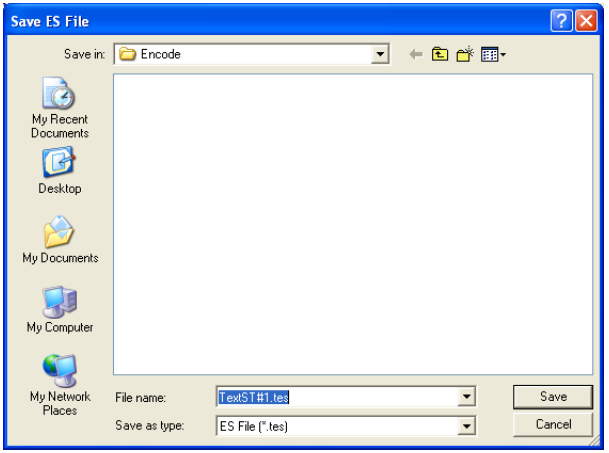
To encode a Text ST:

1 In the Data Tree, right-click the Text ST and choose Encode from the shortcut menu.

Note: Any Text ST that is unencoded shows this icon in the Data Tree:

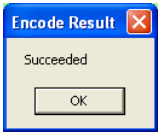


2 Choose Edit > Encode > Build. The Save ES File dialog box appears.



Note: The dialog box automatically selects the Encode folder path that was defined when you created the project.

3 Click Save. Scenarist BD encodes the Text ST. An Encode Result dialog box appears.



4 Click OK. The Text ST is encoded.

Note: Any Text ST that is encoded shows this icon in the Data Tree:

If the text-based subtitle encodes successfully, you are ready to add it to a Clip.

Adding Text STs to projects

Text STs are added to projects by including them in SubPaths of PlayLists. This process involves the following steps:

- Creating a Clip for the Text ST.
- Creating a Text Subtitle SubPath for the PlayList.
- Adding the Text ST Clip to the Text Subtitle SubPath of the PlayList.

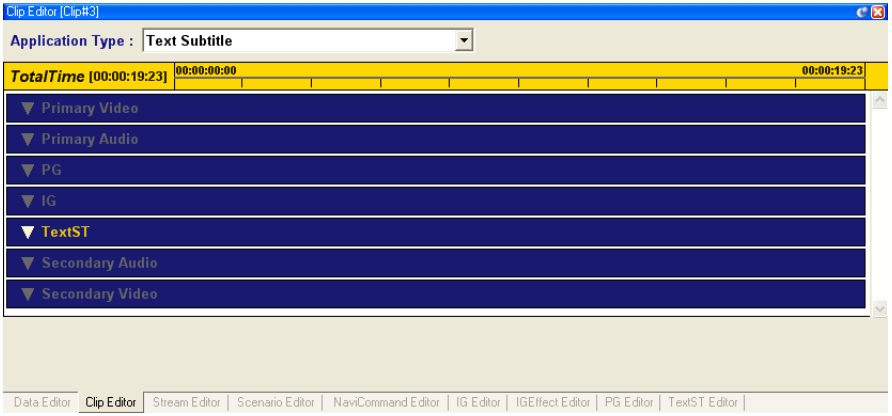
These steps are documented in the following procedure.

To add a Text ST to a project:

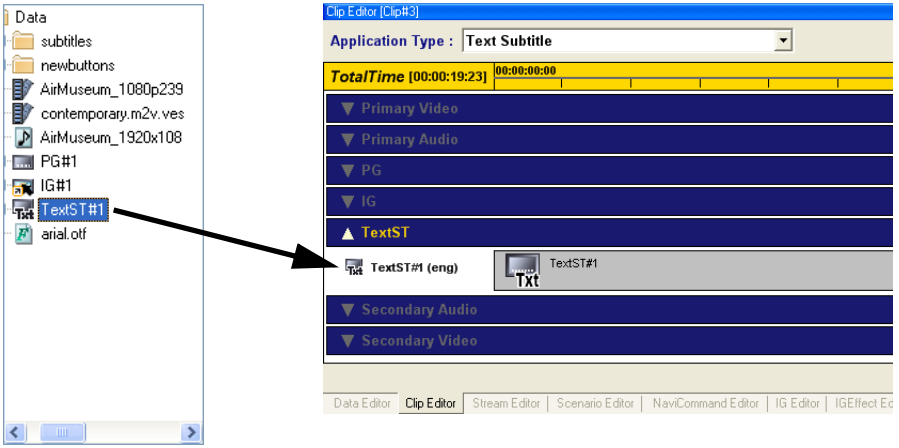
1 In the Stream Tree, right-click the Clip folder to which you will add the Text ST Clip, and choose New > Clip > Text Subtitle from the shortcut menu. The Clip appears in the Stream Tree.

2 To rename the Clip, click its name twice so it becomes selected, enter the new name, and press Enter.

3 Double-click the Clip to display it in the Clip Editor.



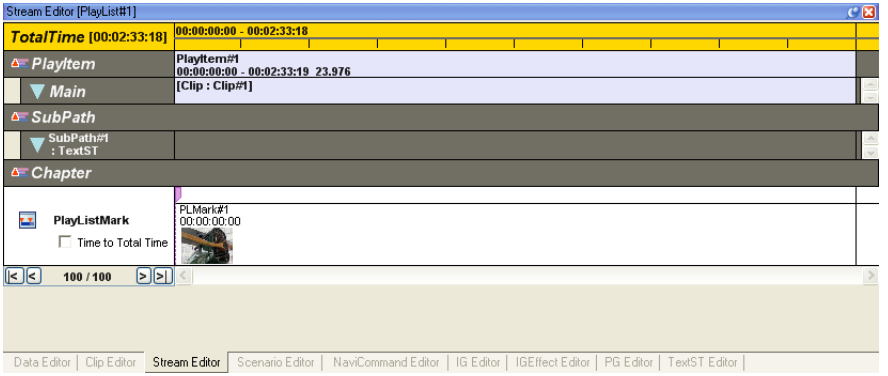
4 Select the Data Tree; then Drag the Text ST asset from the Data Tree onto the Text ST track in the Clip Editor. The Text ST is added to the Clip.



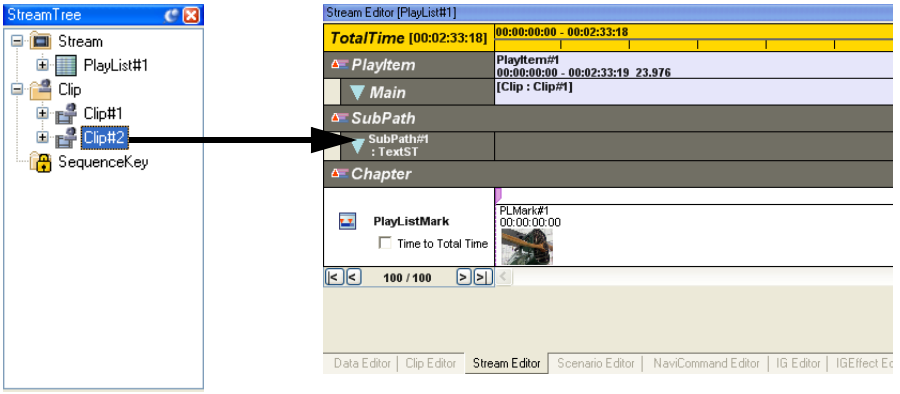
5 In the Stream Tree, right-click the PlayList to which you will add the Text ST Clip, and choose New > SubPath > Text Subtitle from the shortcut menu. The SubPath appears in the Stream Tree.

6 To rename the SubPath, click its name twice so it becomes selected, enter the new name, and press Enter.

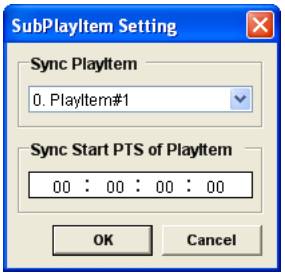
7 Double-click the PlayList to display it in the Stream Editor.



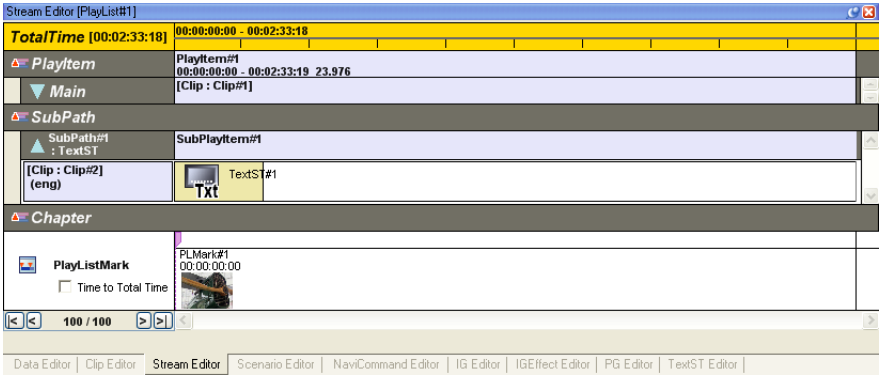
8 Drag the Text ST Clip from the Stream Tree onto the Text ST SubPath track in the Stream Editor.



9 The SubPlay Item Setting dialog box appears.



10 Click OK. The Text ST Clip is added to the project as a SubPath of the PlayList.



15 Importing/updating Designer PS files

This chapter tells you how to import IGs, PGs, and asset sets created using Photoshop and Scenarist Designer PS into a Scenarist BD project, and how to update Designer IG/PG files. It includes the following topics:

- "HDMV graphics and Scenarist Designer PS" on page 326
- "Importing Scenarist Designer PS files into Scenarist BD" on page 327
- "Updating Scenarist Designer PS graphics" on page 337

HDMV graphics and Scenarist Designer PS

The current BD-ROM specification requires images in the interactive plane and presentation plane to have no more than 256 ARGB colors (Alpha + Red + Green + Blue) that are indexed. The index numbers reference to a palette that describes the colors in the image. The alpha channel (variable transparency) information is stored in the palette, per color.

Scenarist Designer PS is a Photoshop plug-in that helps deal with the strictures created by these palette limitations. It can be used to optimize and normalize the color palette(s) of images created in Photoshop, so that they will adhere to the specific color requirements of the interactive and presentation planes in the HDMV format. Scenarist Designer PS processes the Photoshop graphic elements, dithering images if necessary to adapt them to the optimized color palette(s); it then exports the Photoshop file in a format that can be imported directly into a Scenarist BD project.

Note: Scenarist Designer PS requires that Photoshop CS or higher be installed on the user's system. If Photoshop is not installed, or if the installed version is lower than CS, the Scenarist BD installer will not install Scenarist Designer PS.

Both interactive graphics and presentation graphics are defined by a hierarchy of layers that delineate the structures needed to create IGs or PGs in Scenarist BD. These layers must be created within a Photoshop file in order for Scenarist Designer PS to export it successfully.

The arrangement of layers affects how Scenarist Designer PS builds optimized palettes and exports images. Scenarist Designer PS exports files that become either interactive graphics (IGs), presentation graphics (PGs), or asset sets. Each single Photoshop file must be layered to reflect the structure of one of these types of files.

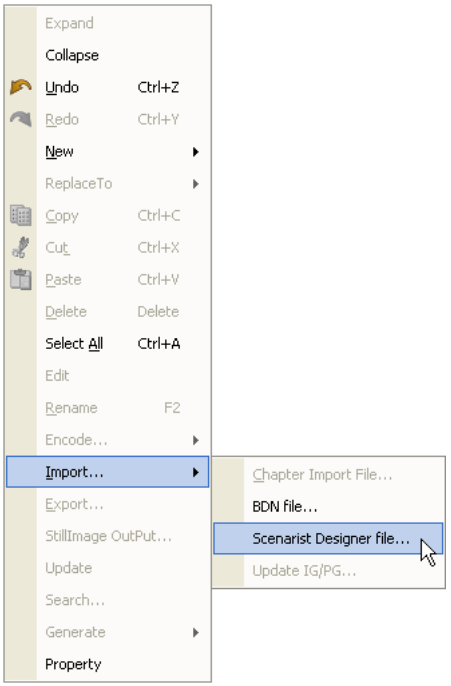
Note: For information on using Photoshop and Scenarist Designer PS to create and export IG files, PG files, or asset sets, see the *Scenarist Designer PS User Guide*.

Importing Scenarist Designer PS files into Scenarist BD

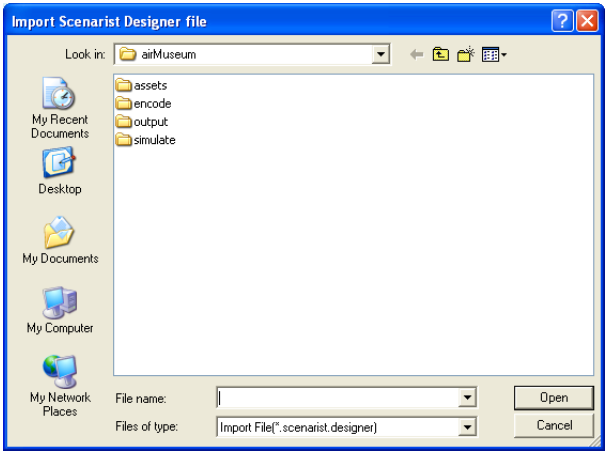
If you create graphics files using Photoshop and Scenarist Designer PS, you can import them directly into a Scenarist BD project.

To import a Scenarist Designer PS graphic file into Scenarist BD:

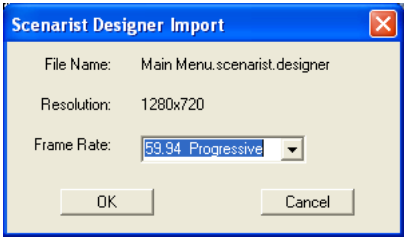
1. Open your project within Scenarist BD.
2. In the Data Tree, right-click the Data folder, and choose Import > Scenarist Designer file from the shortcut menu.



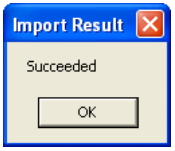
The Import Scenarist Designer File dialog box appears.



3 Locate the Scenarist Designer PS file you want to import; then click Open. The Scenarist Designer Import dialog box appears.

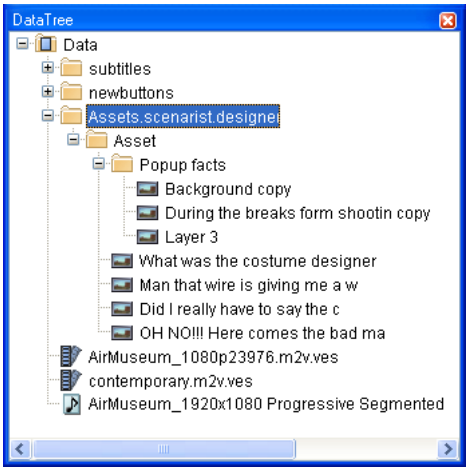


4 Select the proper Frame Rate; then click OK. The Import Result dialog box appears.



Note: If the imported file is a group of assets, the Scenarist Designer Import dialog box does not appear, since you do not need to set a Frame Rate for an asset set.

The imported graphics asset appears in the Data Tree.



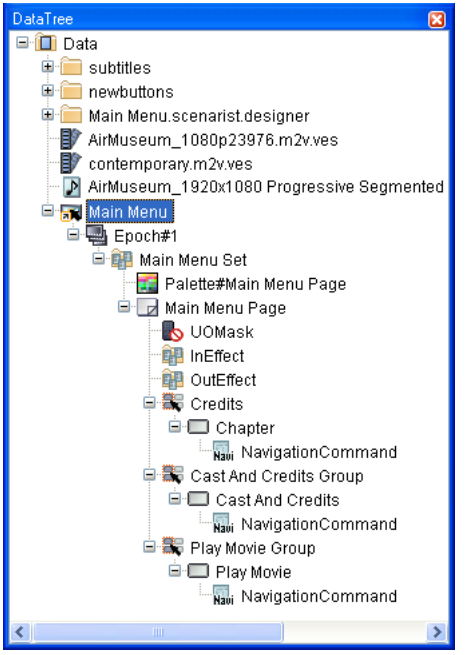
If you have imported an asset set, the import process is finished. If you have imported an interactive graphic (IG) or presentation graphic (PG), there are a few additional steps. These are described in detail in the following sections:

- “Completing IG imports” on page 330
- “Completing PG imports” on page 334

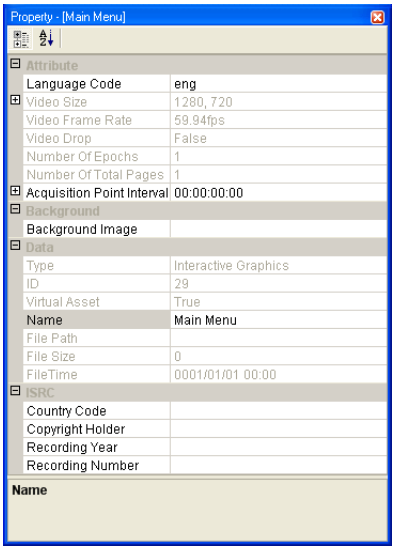
Completing IG imports

To complete the import of a Scenarist Designer PS IG:

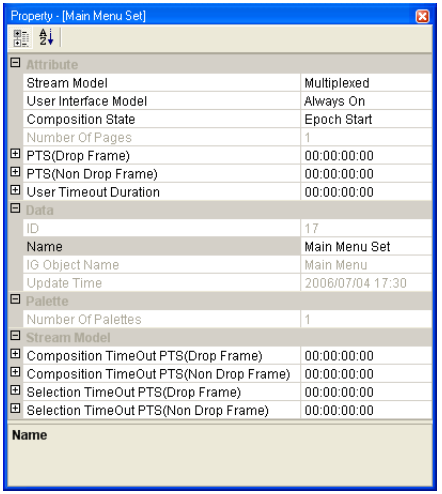
1 Expand the IG virtual asset in the Data Tree so all of its components are visible.



2 In the Data Tree, select the IG virtual asset, then set the Acquisition Point Interval in the Properties window.



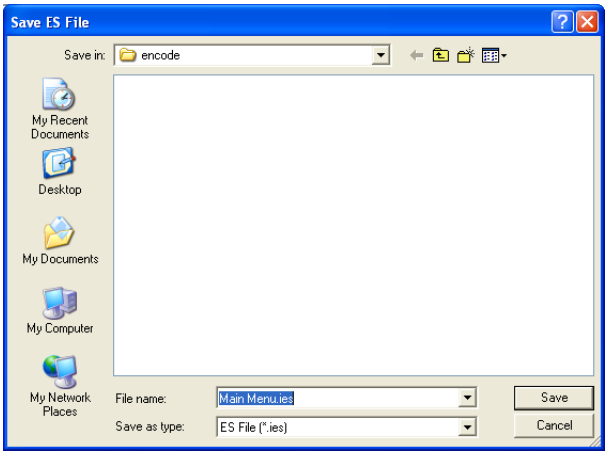
3 In the Data Tree, select the first Display Set object, then select or enter appropriate values in the Properties window.



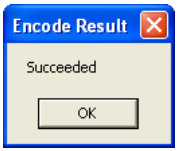
- **PTS (Drop Frame)** sets the PTS start time for the IG Display Set (in drop frame contexts); you may need to adjust this value to allow for decoding time (depending on the size of the IG).
- **PTS (Non Drop Frame)** sets the PTS start time for the IG Display Set (in non drop frame contexts); you may need to adjust this value to allow for decoding time (depending on the size of the IG).
- **User Timeout Duration** sets how long the IG Display Set is displayed with no user activity before it is removed. If set to zero (00:00:00:00), the duration is "infinite"; if User Interface Model is "Always On," the timeout duration is taken to be zero ("infinite"); if User Interface Model is "Pop Up," the IG Display Set disappears after the timeout duration.
- **Composition Timeout PTS (Drop Frame)** sets how long the IG is displayed (in drop frame contexts) before it is removed.
- **Composition Timeout PTS (Non Drop Frame)** sets how long the IG is displayed (in non drop frame contexts) before it is removed.
- **Selection Timeout PTS (Drop Frame)** sets the valid interaction time within an Epoch (in drop frame contexts).
- **Selection Timeout PTS (Non Drop Frame)** sets the valid interaction time within an Epoch (in non drop frame contexts).

4 Set appropriate Properties values for each Display Set object in the IG.

5 Right Click the IG virtual asset, then select Encode > Build from the Shortcut menu. The Save ES file appears.



6 Click Save. Scenarist BD encodes the IG. The Encode result dialog box appears.

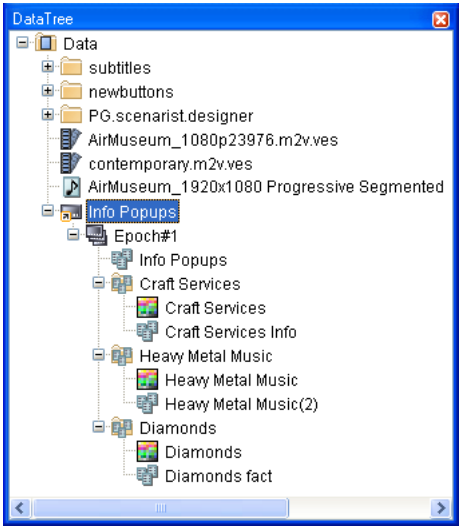


The IG import process is complete.

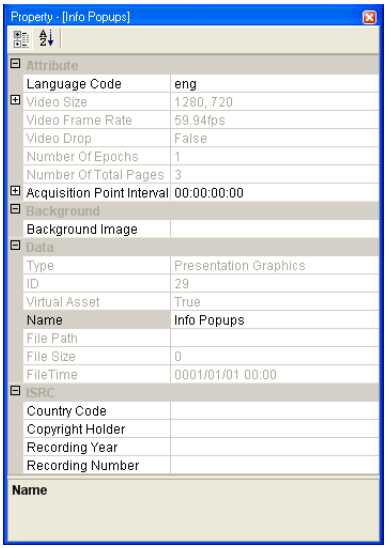
Completing PG imports

To complete the import of a Scenarist Designer PS PG:

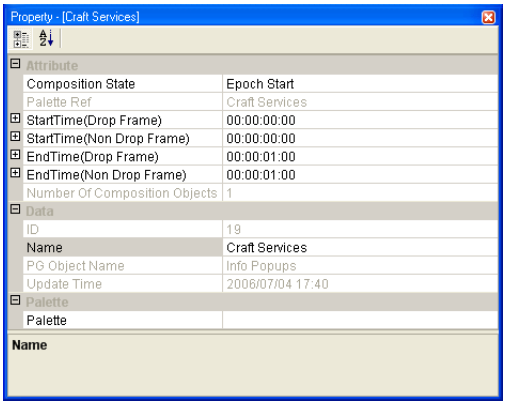
1 Expand the PG virtual asset in the Data Tree so all of its components are visible.



2 In the Data Tree, select the PG virtual asset, then set the Acquisition Point Interval in the Properties window.



3 In the Data Tree, select the first Display Set object, then select or enter appropriate values in the Properties window.

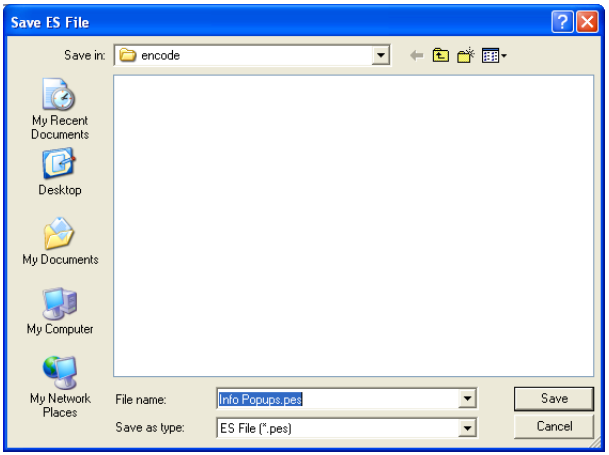


- **Start Time (Drop Frame)** sets the PTS to begin display of the PG (in drop-frame contexts).

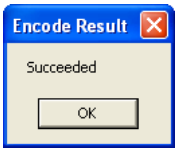
- **Start Time (Non Drop Frame)** sets the PTS to begin display of the PG (in non-drop-frame contexts).
- **End Time (Drop Frame)** sets the PTS to end display of the PG (in drop-frame contexts).
- **End Time (Non Drop Frame)** sets the PTS to end display of the PG (in non-drop-frame contexts).

4 Set appropriate Properties values for each Display Set object in the PG.

5 Right Click the PG virtual asset, then select Encode > Build from the Shortcut menu. The Save ES file appears.



6 Click Save. Scenarist BD encodes the PG. The Encode result dialog box appears.



The PG import process is complete.

Updating Scenarist Designer PS graphics

If you need to change elements of an IG or PG asset created using Photoshop and Scenarist Designer PS, Scenarist BD makes it possible for you to effect your changes using those programs, and then update the registered asset as it exists in your Scenarist BD project. Only certain properties of the various Photoshop layers (and the HDMV objects they represent) may be updated.

Table 1: *IG updateable properties*

Photoshop layer	Scenarist BD object	Updateable properties
IG:	Interactive Graphics	[none]
DS:	Display Set	[none]
[none]	Palette	Colors.
P:	Page	[none]
BG:	Common Background	[none]
BOG:	Button Overlap Group	Size, Position.
B:	Button	Size, Position.
N:	Normal State (IG button)	Artwork.
A:	Active State (IG button)	Artwork.
S:	Selected State (IG button}	Artwork.

Table 2: *PG updateable properties*

Photoshop layer	Scenarist BD object	Updateable properties
PG:	Presentation Graphics	[none]
W:	Window	Size, Position.
DS:	Display Set	[none]
BG:	Common Background	[none]
[none]	Palette	Colors.
<layer>	Composition Object	WindowRef, Position.

In addition, there are certain rules that govern the update process:

- The updated file must be of the same type as the project asset being updated.
- The name of the updated file must be the same as that of the file originally imported into your project.
- Any item from the originally imported Designer file that is missing from the updated Designer file will be removed from your project.
- Any item that is new to the file is added to the IG/PG tree in your project.
- Any changes made to BOGs and buttons will not destroy navigation commands, unless the BOG/button is being removed.
- Any object properties not associated with the visual elements supported by Designer remain as set in Scenarist BD (they are not overwritten).

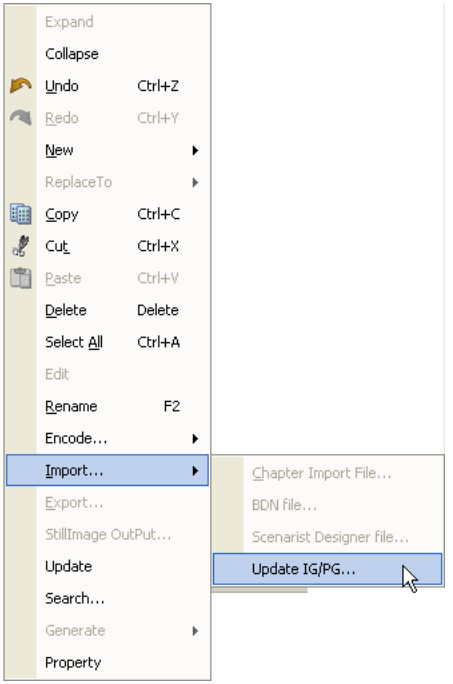
To update a Designer IG or PG asset:

1. WIthin Photoshop, make any necessary changes to the IG/PG asset. (For more information, see the *Scenarist Designer PS User Guide*.)
2. Export the IG/PG asset file, using Scenarist Designer PS. (For more information, see the *Scenarist Designer PS User Guide*.)
3. Close Scenarist Designer PS.

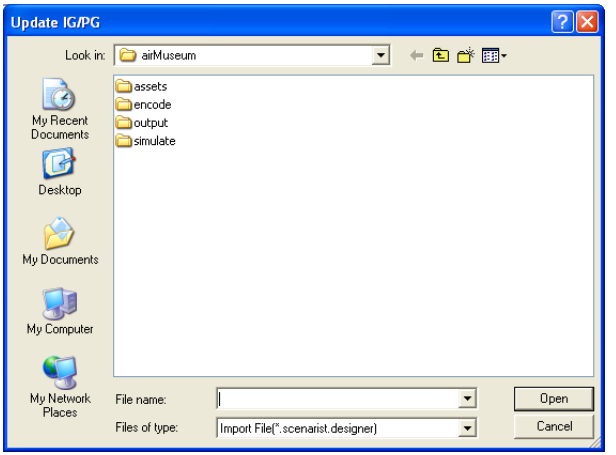
4 Close Photoshop.

5 Launch Scenarist BD and open your project.

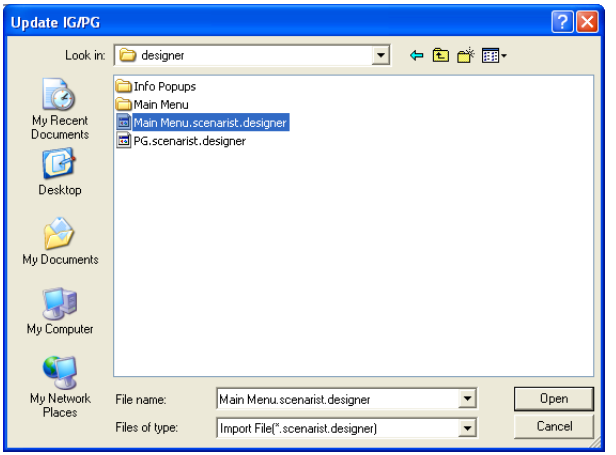
6 In the Data Tree, right-click on the Designer IG/PG asset you want to update, and choose Import > Update IG/PG from the shortcut menu.



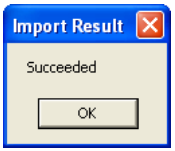
The Update IG/PG dialog box appears.



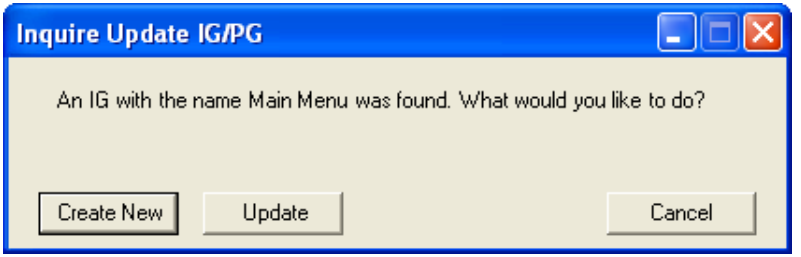
7 Locate the Scenarist Designer PS file you want to update.



8 Click Open. The Import Result dialog box appears.



Note: If you right-click on the Data folder in the Data Tree, select Import > Scenarist Designer file from the shortcut menu, and choose a Scenarist Designer PS file that is already part of your project, the Inquire Update IG/PG dialog box appears:



To update the existing IG/PG in your project, click Update. To create a new IG/PG asset in your project (using the same Designer file), click Create New.

16 Titles and movie objects

Titles and movie objects are used to define how a project is presented to the viewer, and how it can be navigated. This chapter documents how to add titles to a project and how to link them to playlists. It includes the following topics:

- "Titles" on page 344
- "Tips for working in the Scenario Editor" on page 347
- "Navigation commands" on page 348

Titles

Titles are the movies, slideshows, and bonus content residing on finalized discs that the user can view. Titles are added in the Scenario Editor and contain movie objects that link to PlayLists. The following sections document how to add titles and link them to PlayLists:

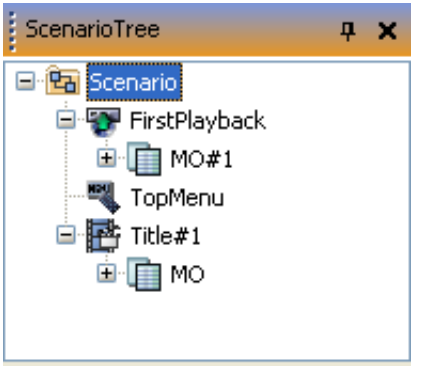
- "Adding titles" on page 344
- "Linking content to titles" on page 346
- "Deleting titles" on page 347

Adding titles

New projects contain only a First Playback and Top Menu by default. The following procedure documents how to add titles to the project.

To add a new title:

- In the Scenario Tree, right-click the Scenario folder, and choose New > HDMV Title from the shortcut menu. A new title containing a movie object is added to the Scenario Tree.

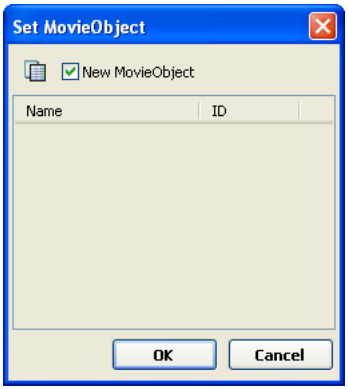


Adding movie objects

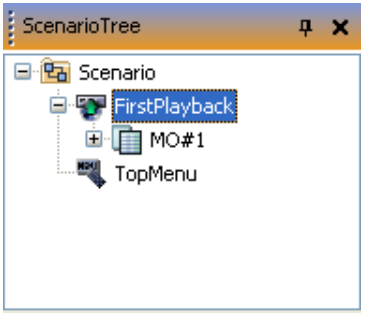
Movie objects contain navigation commands that point to PlayLists and PlayItems. When you add HDMV Titles to a project, they automatically contain movie objects. However, in order to link content to the First Playback and Top Menu, you need to add movie objects to them.

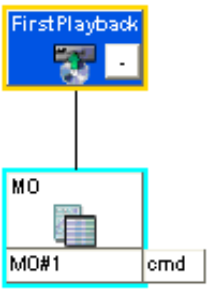
To add a movie object to the First Playback or Top Menu:

1. Right-click the First Playback or Top Menu in the Scenario Tree and choose Set MovieObject from the shortcut menu.
2. In the Set MovieObject dialog box, confirm that New MovieObject is selected.



3. click OK. A movie object is added.



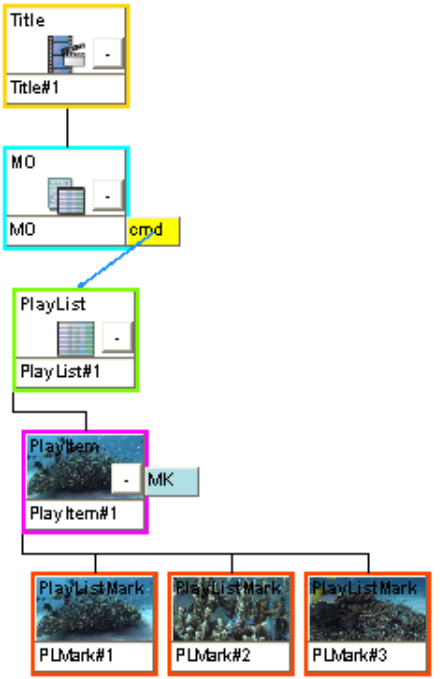


Linking content to titles

The easiest way to link content to titles is by dragging PlayLists from the Stream Tree into the Scenario Editor. You can also link content by adding navigation commands to movie objects in the Navigation Editor (see “Adding navigation commands in the Navigation Editor” on page 350).

To link content to a title:

- Drag a PlayList from the Stream Tree onto a movie object in the Scenario Editor. The PlayList is added to the movie object, complete with any PlayItems and PlayListMarks contained in the PlayList.



Note: You can also drag PlayItems and PlayListMarks from the Stream Tree onto movie objects if you want the title to begin playing from those locations, instead of from the start of a PlayList.

Deleting titles

Only HDMV titles can be deleted from the project. The First Playback and Top Menu cannot be deleted.

To delete a title from the project, do one of the following:

- Select the title you want to delete, either in the Scenario Tree or Scenario Editor, and choose Edit > Delete, or press the Delete key.
- Right-click the title you want to delete in the Scenario Tree or Scenario Editor, and choose Delete from the shortcut menu.

Tips for working in the Scenario Editor

Some tips for working in the Scenario Editor include:

- To collapse or expand a title, movie object, PlayList, or any PlayList component, click the Plus/Minus button on the object.
- To locate and select an object automatically in a crowded scenario, select the object in the Scenario Tree. The Scenario Editor automatically scrolls to the object and selects it.
- To align scenario objects neatly, right-click in the Scenario Editor and choose Align All from the shortcut menu.
- To hide or show the lines connecting objects in the Scenario Editor, click the Line Show/Hide button in the toolbar.

Select which lines you want to show. To show all lines, select the All option

- To zoom the Scenario Editor, use the Zoom In and Zoom Out buttons in the toolbar, or select a zoom value from the View > Zoom submenu.

Navigation commands

When dragging PlayLists from the Stream Tree onto movie objects in the Scenario Editor, a navigation command (PlayPL) is added to the movie object that points to the PlayList. Movie objects can contain other types of commands (for setting system parameters, playback settings, or determining what happens when the title finishes playing), as well as multiple commands. Button objects can also contain navigation commands, which are executed when the button is activated by the viewer.

You can add navigation commands in the Scenario Editor with the Connect tool, or you can use the Navigation Editor to edit commands or insert them manually.

This section includes the following topics:

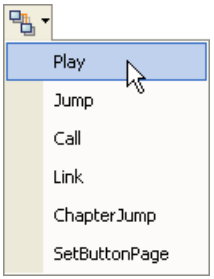
- "Adding navigation commands in the Scenario Editor" on page 349
- "Adding navigation commands in the Navigation Editor" on page 350
- "Deleting all navigation commands" on page 352
- "Navigation command types" on page 352

Adding navigation commands in the Scenario Editor

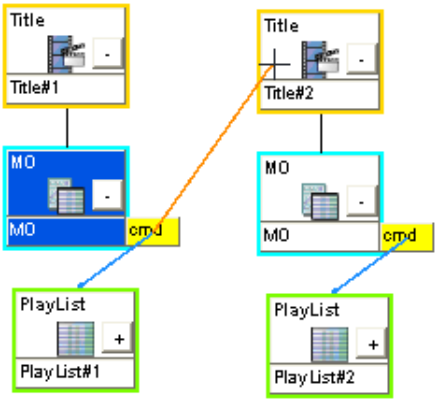
You can add navigation commands to movie and button objects in the Scenario Editor with the Connect tool. If the object already contains navigation commands, the new command is appended to the end of the command list.

To add a navigation command in the Scenario Editor:

1. Click in the Scenario Editor to make it the current window.
2. Set the Connect button in the toolbar to the type of navigation command you want to add (see "Navigation command types" on page 352).



3. Click the CMD flag of the movie or button object to which you will add the navigation command.



4 Drag to one of the following destinations for the navigation command. Depending on the navigation command type and CMD source, the available link destinations will vary.

- Title
- Movie object
- PlayList
- PlayItem
- PlayListMark
- Page

5 As you drag the mouse, a line appears that will connect the source and destination. When you release the mouse button, the navigation command is added to the movie or button object.

Adding navigation commands in the Navigation Editor

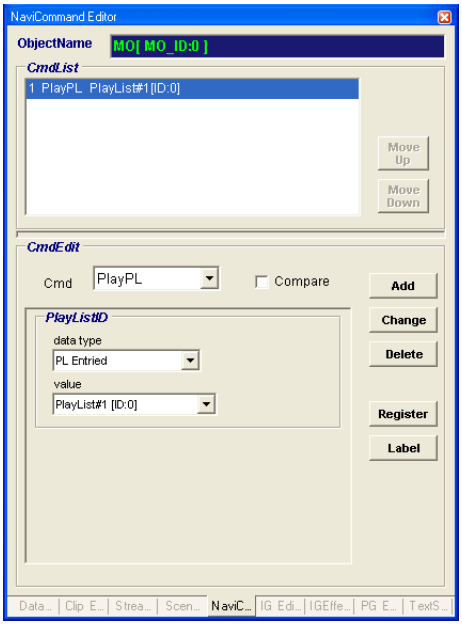
To add or edit navigation commands in the Navigation Editor

1 Do one of the following:

- Select a movie object or button object in the Scenario Tree, then click the NaviCommand Editor tab in the Editor window. The object's navigation commands are displayed in the Navigation Editor.
- Double-click a Navigation object in the Scenario Tree to display its navigation commands in the Navigation Editor automatically.

2 If the movie object or button object has no defined navigation commands, you can select the default Nop command and edit it. If the object contains previously defined navigation commands and you want to edit one of those, select the command you want to edit.

3 Using the Cmd drop-down list, select the command type you want to add (see “Navigation command types” on page 352). Configure additional options for the command as needed.



4 Do one of the following:

- Click Add to add the navigation command to the command list.
- Click Change to edit the previously selected navigation command.

5 If the object contains multiple navigation commands and you want to change the position of the command, select the command and click Move Up or Move Down.

6 To delete a navigation command from the command list, select the command you want to delete and click Delete.

Deleting all navigation commands

To delete all navigation commands in a movie or button object:

1. Select a movie object or button object in the Scenario Tree or Scenario Editor.
2. Choose Edit > Delete All NaviCmd, or right-click in the Scenario Editor and choose Delete All NaviCmd from the shortcut menu.

Navigation command types

Below is a brief summary of the different navigation commands:

Nop No command.

Note: Nop commands are useful as label placeholders.

GoTo Jumps to a specified command label.

Break Stops executing commands in the current command list.

JumpObject Discards the current movie object and branches to the specified movie object. Resuming playback of the previous movie object with the Resume command is not possible after executing a JumpObject command.

JumpTitle Discards the current title and branches to the specified title. Resuming playback of the previous title with the Resume command is not possible after executing a JumpTitle command.

CallObject Suspends playback of the current movie object and branches to the specified movie object. Resuming playback of the previous movie object with the Resume command is possible after executing a CallObject command.

CallTitle Suspends playback of the current title and branches to the specified title. Resuming playback of the previous title with the Resume command is possible after executing a CallObject command.

Resume Resumes playback of the previously suspended movie object.

PlayPL Plays the specified PlayList. Only available as a movie object command.

PlayPLatPI Plays the specified PlayItem. Only available as a movie object command.

PlayPLatMk Plays a PlayList from the specified PlayListMark. Only available as a movie object command.

TerminatePL Terminates the current PlayList. Only available as a button command.

LinkPI Branches to the specified PlayItem. Only available as a button command.

LinkMK Branches to the specified PlayListMark. Only available as a button command.

StillOn Pauses playback of presentation graphics. Only available as a button command.

StillOff Resumes playback of presentation graphics. Only available as a button command.

Set Performs an operation using a "source" and a "destination" operand, assigning the result to the destination operand.

- **Move** (Source) → Destination
  Stores a value (GPR, PSR, or immediate) in a GPR.
- **Swap** (Source) ↔Destination
  Exchange the value of two GPRs.
- **Add** (Source) + (Destination) → Destination
  Addition
- **Sub** (Destination) – (Source) → Destination
  Subtraction
- **Mul** (Source) * (Destination) → Destination
  Multiplication

- **Div** (Destination) / (Source) → Destination
  Division
- **Mod** (Destination) % (Source) → Destination
  Modulus
- **Rnd** Random(Source) → (Destination)
  Generates a random number between "1" and (Source)
- **And** (Source) & (Destination) → Destination
  Bitwise AND
- **Or** (Source) | (Destination) → Destination
  Bitwise OR
- **Xor** (Source) ^ (Destination) → Destination
  Bitwise Exclusive OR
- **Bit Set** 1 → <bit number = Source> of Destination
  Sets the specified bit of the Destination to "1"
- **Bit Clear** 0 → <bit number = Source> of Destination
  Sets the specified bit of the Destination to "0"
- **Shift Left** (Destination) Shifted by <count = Source> → Destination
  Moves the Destination left by the specified number of bits
- **Shift Right** (Destination) Shifted by <count = Source> → Destination
  Moves the Destination right by the specified number of bits

SetSystem Sets system values for stream numbers, the Navigation Timer, and button parameters.

- **SetStream** Sets the current Primary audio, PG TextST, Angle, and Interactive Graphics streams to be presented.
- **SetNVTimer** Sets the initial time (0-300 seconds) and starts the Timer. When the Timer reaches "0," a Jump operation to the specified Movie Object is executed.
- **SetButtonPage** Set selected Button ID and/or set Page ID.

- **EnableButton** Sets the specified Button to its Normal state, if currently Disabled. Commonly used to specify the topmost Button in a Button Overlap Group (BOG). If the specified Button is in the same Button Overlap Group as the current Button, then commands after the EnableButton command continue to be executed.
- **DisableButton** Disables the specified Button. If the specified button is the current button, then commands after the DisableButton command continue to be executed. If no new Button has been selected before the end of the command sequence, the Page's Default Selected Button is selected.
- **SetSecondaryStream** Sets the current Secondary video, Secondary audio, and PiP PG TextST streams to be presented.
- **Pop up Menu Off** Immediately displays the OutEffect of the current Page if present, and then removes the Interactive Graphics display.

17 BD-J titles

This chapter introduces you to BD-J mode; it tells you how to create a BD-J project in Scenarist BD, how to import a Java project from Scenarist BD-J into Scenarist BD, and how to create BDJOs in Scenarist BD. It includes the following introductory topics:

- "Introduction to Blu-ray BD-J mode" on page 358
- "Comparison of HDMV to BD-J" on page 359
- "BD-J graphic planes" on page 360
- "Creating BD-J projects in Scenarist BD" on page 362
- "Importing Scenarist BD-J Java projects" on page 364
- "Creating BDJOs in Scenarist BD" on page 367
- "BD-J development with Ensequence on-Q" on page 378

Introduction to Blu-ray BD-J mode

BD-J mode is a fully programmable application environment based on the Java platform. It allows for the creation of compelling interactive experiences, which are traditionally only found as ROM features for PCs on DVD video. There can be one Java application on the whole disc, or they can be provided on a title-by-title basis. They can also be provided in combination with HDMV content, but each title can be only one or the other (HDMV or BD-J).

BD-J mode is based on MHP (Multimedia Home Platform) and GEM (Globally Executable MHP), which are commonly used for Cable TV applications, and which in turn are built on packages such as JavaTV and the Java Media Framework (JMF).

You will want to use BD-J if you want to include any of the following in a title:

- applications that respond dynamically to user input
- games
- network-enabled application
- video scaling
- applications that read or write local storage
- overlapping buttons

Note: For more information on BD-J mode, see the *Scenarist BD-J User Guide*.

Comparison of HDMV to BD-J

There are numerous differences between HDMV mode and BD-J mode:

Table 1: *Comparison of HDMV to BD-J*

Category	HDMV	BD-J
Programming	Command Language.	Full Object Oriented language, supporting multiple concurrent applications.
Compositing Model	3 Layers: • Video • Presentation Graphics • Interactive Graphics 256 colors, 8-bit alpha.	3 Layers: • Background • Video • Java Graphics True color, 8-bit alpha.
Code Scope	Movie Object (though registers can carry across titles).	Title, Multi-Title, Disc, or Disc Set.
Online Connectivity	Not supported.	Supported in Profile Type 2 (Full Profile).
Video Scaling	Supported in Profile Type 1.1. **Note:** HDMV scaling is limited to the asset's natural size or full screen.	Supported.
Local Storage	Not supported.	Supported.
Buttons	Native HDMV Objects. Can't overlap. Each state can use colors from a shared 8-bit palette with transparency.	HDMV Objects not supported. Can use HAVi buttons. Can overlap. Can use true color images with transparency.

BD-J graphic planes

The BD-J format allows for the following independent image planes:

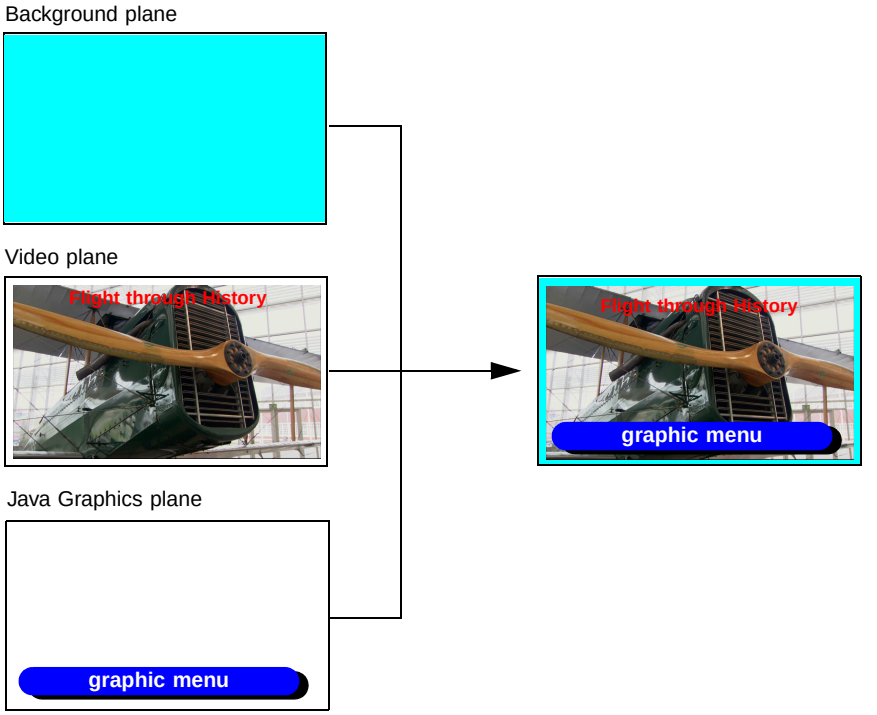


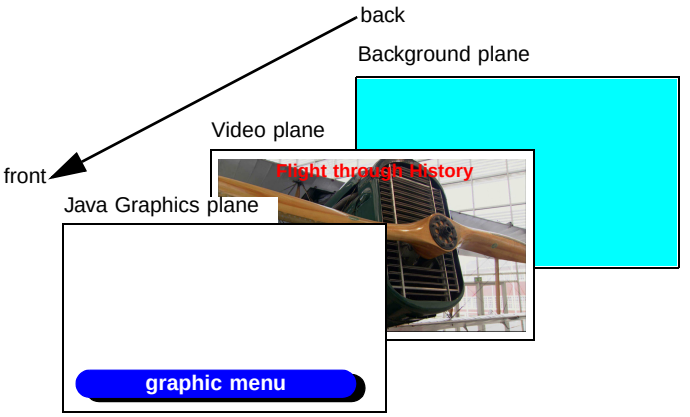
Image planes for BD-J titles

Background plane Sits at the back, behind the video. Displays a single image or a single color. It provides a backdrop for the video, if the video is scaled.

Video plane Displays video and associated presentation graphics, including subtitles, titles, labels, or graphics. The video and the associated presentation graphics can be scaled. (The presentation graphics scale with the video.) The video plane is completely independent of the other image planes, allowing menu buttons to be navigated with no interruption in playback.

Java Graphics plane Displays the graphic user interface (GUI) for the BD-J application. It is similar to the IG plane in HDMV.

The three BD-J image planes are layered:

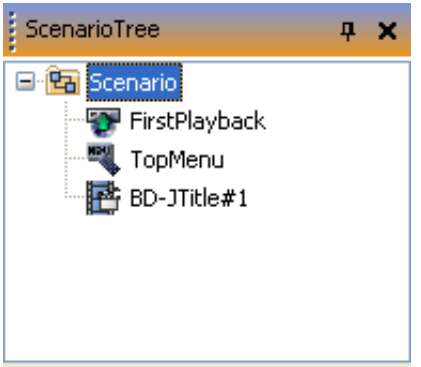


Layering of image planes in BD-J

Creating BD-J projects in Scenarist BD

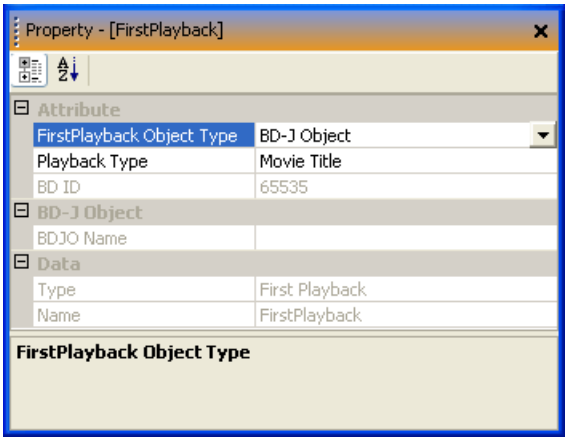
To create a BD-J project in Scenarist BD:

1. Follow the steps in "Creating Solutions and Projects" on page 55 to create a new Solution, Disc Project, and Project.
2. Prepare and import video, audio, and (presentation) graphic assets into the project. For more information, see Chapter 3 ("Preparing assets" on page 33), Chapter 4 ("Creating Solutions and Projects" on page 55), and Chapter 6 ("Managing assets" on page 89).
3. Set up Clips, PlayLists, and PlayItems. For more information, see Chapter 8 ("Movies and slideshows" on page 139).
4. Prepare subtitles and other presentation graphics. For more information, see Chapter 12 ("Presentation graphics" on page 253) and Chapter 14 ("Text-based subtitles" on page 301).
5. In the Scenario Tree, right-click the Scenario folder, and choose New > BD-J Title from the shortcut menu. A new BD-J title appears in the Scenario Tree.



6. In the Scenario Tree, click on First Playback to select it.

7 In the Properties window, set First Playback Object Type to BDJObject (instead of MovieObject).



You can now set the BD-J Title as the First Playback item.

Note: By default, the First Playback in Scenarist BD is a MovieObject, not a BD-J object. To set a BD-J title to play immediately, you must define the First Playback as a BD-J Object.

8 If appropriate, continue to set up titles and movie objects, and link content to titles. For more information, see Chapter 16 (“Titles and movie objects” on page 343).

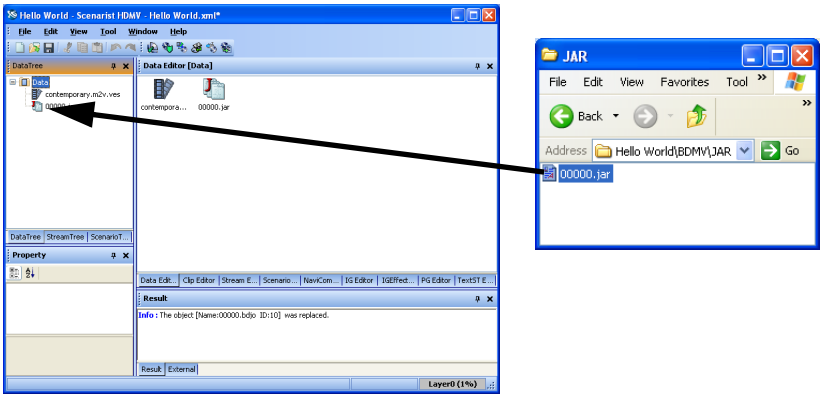
9 Choose File > Save Project to save your project.

10 Choose File > Exit to close the Scenarist BD application.

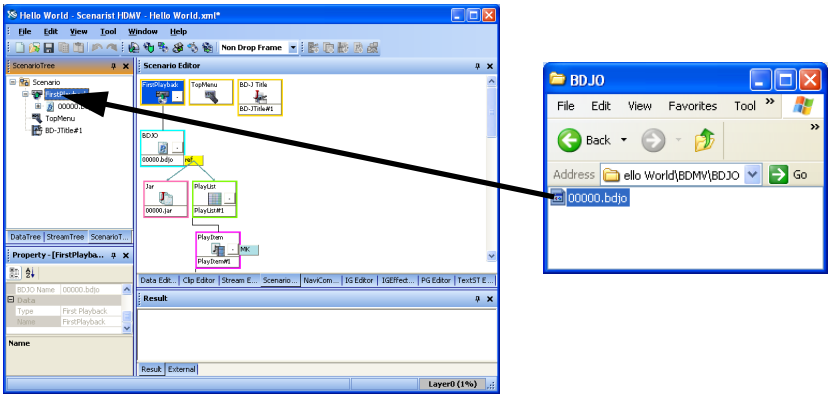
Importing Scenarist BD-J Java projects

To import a Scenarist BD-J Java project into Scenarist BD:

1. From the Windows Start menu, choose All Programs > Sonic > Scenarist BD > Scenarist BD. Scenarist BD opens.
2. Choose File > Open Project file. The Open Project file dialog box appears.
3. Select the project to which you want to import the BD-J files; then click Open.
4. Locate the JAR file from your Scenarist BD-J project; drag it into the Data Tree in Scenarist BD.



5 Locate the BDJO from your Scenarist BD-J project; drag it to the First Playback item in the Scenario tree in Scenarist BD.



6 Choose File > Save.

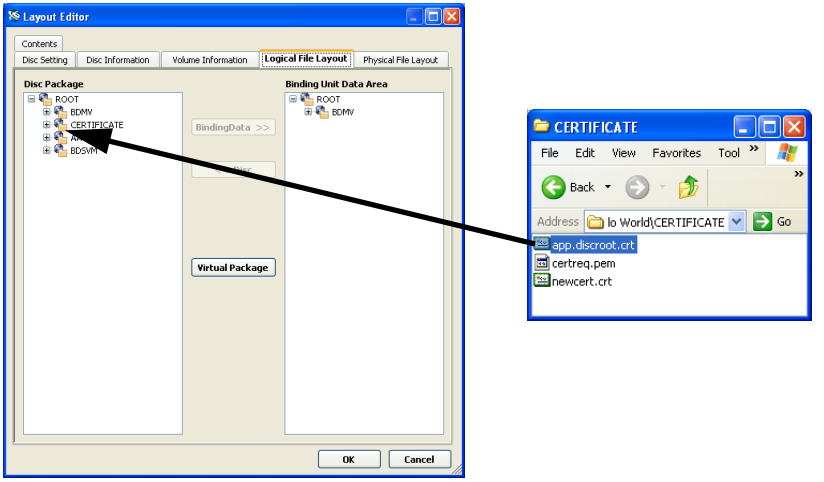
Placing the root certificate

If the JAR file containing the BD-J application has been signed, you must place the "app.discroot.crt" file in the CERTIFICATE directory of the Blu-ray Disc.

To place the root certificate:

1 In Scenarist BD, Choose Tool > Disc Layout, and select the Logical File Layout tab.

2 Locate the “app.discroot.crt” file created as part of the JAR signing process (for details, see Chapter 8 of the *Scenarist BD-J User Guide*; in particular, see the section called “Building and Signing JAR files”). Drag it to the CERTIFICATE directory displayed in the Disc Package view in the Layout Editor.



3 Click OK.

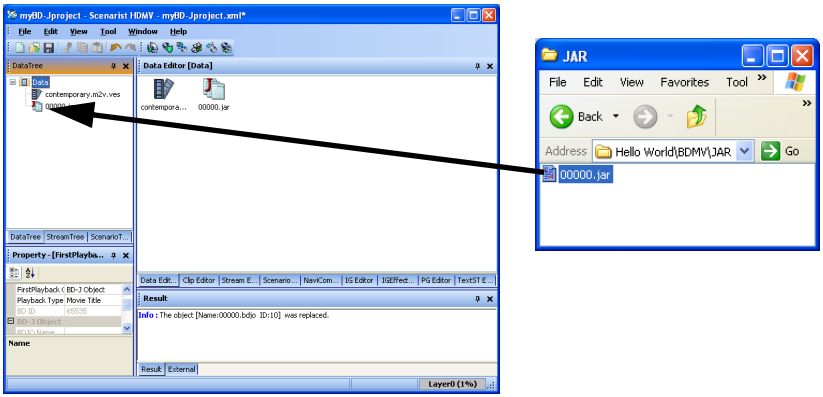
4 Choose File > Save.

Creating BDJOs in Scenarist BD

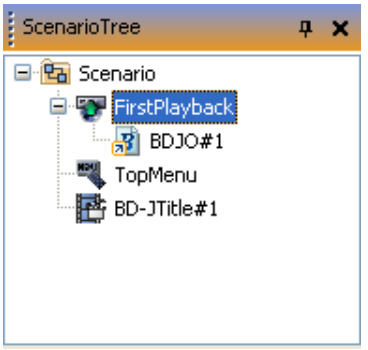
If you generate Java code for BD-J titles using an application other than Scenarist BD-J, you can import your JAR file into Scenarist BD, and then create the necessary BDJO (BD-J Object) file within Scenarist BD.

To create a BDJO in Scenarist BD:

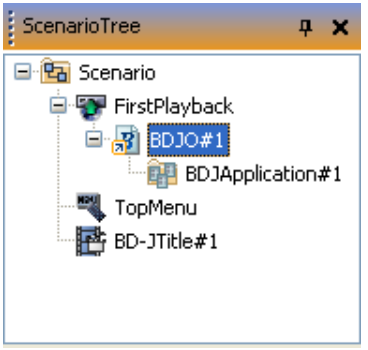
1. From the Windows Start menu, choose All Programs > Sonic > Scenarist BD > Scenarist BD. Scenarist BD opens.
2. Choose File > Open Project file. The Open Project file dialog box appears.
3. Select the project to which you want to create the BD-J Object; then click Open.
4. Locate the JAR file for your project; drag it into the Data Tree in Scenarist BD.



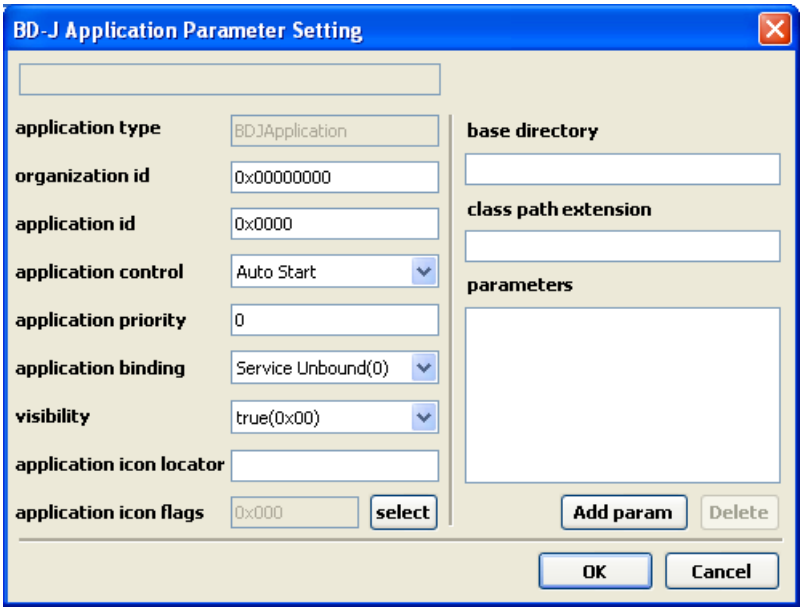
5 In the Scenario Tree, right-click on First Playback, then choose New > BD-J Object from the shortcut menu. A BD-J Object appears in the Scenario Tree.



6 In the Scenario Tree, right-click on the BD-J Object, then choose New > BD-J Application from the shortcut menu. A BD-J Application appears in the Scenario Tree.



7 Double-click on the BD-J Application. The BD-J Application Parameter Setting dialog box appears.



8 Enter or select appropriate values for the fields.

- application type is a read-only field.
- organization id is the Organization ID created for the Producer certificate (for details, see the *Scenarist Safeguard User Guide*).
- application id is a unique 16-bit value that identifies the application function. This is allocated by the organization registered with the organization id who decides the policy for allocation within the organization. Values of zero will not be encoded. The application id values are divided into two ranges, one for unsigned applications and one for signed applications. This is for security reasons. Applications transmitted as unsigned will use an application id from the unsigned applications range, and applications transmitted as signed will use an application id from the signed applications range.

application id values	use
0x0000...0x3fff	Application ids for unsigned applications.
0x4000...0x7fff	Application ids for signed applications.
0x8000...0xfffd	Reserved for future use by DVB.
0xfffe, 0xffff	Not used in BD-J.

- **application control** allows the content provider to signal the initial lifecycle state of the application after title selection to the BD-J terminal.

control values	description
Auto Start	The class implementing the Xlet is loaded into the VM, an Xlet object is instantiated, and the application is started (subject to usual restrictions).
Present	The application is present in the title, but is not autostarted.

- **application priority** identifies a relative priority between the applications signaled in this service. Where there are insufficient resources to continue running a set of applications, this priority is used to determine which applications to stop or pause. A larger integer value indicates higher priority. There will be at least 32 priority levels.

- **application binding** specifies whether or not an application is bound to a title and/or a disc.

Note: GEM divides applications into service bound and not service bound, sometimes referred to as "service unbound." BD-J provides refined signaling for not service bound applications. Obviously for a disc environment, such applications can be bound to a disc or not. BD-J's refined signaling allows controlling the lifecycle behavior of running not service bound applications when the disc is ejected. BD-J also specifies the lifecycle behavior of running service bound applications when the current disc is ejected.

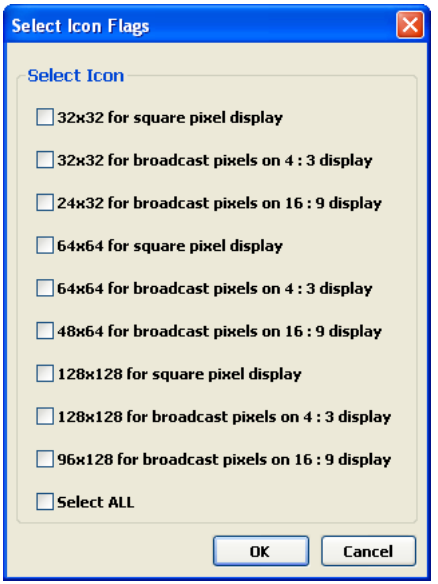
value	DVB-GEM [4] correspondence	additional semantics for BD-J
Service Unbound(0)	Service unbound Semantics for service unbound applications as defined in DVB-GEM [4] apply.	This value indicates a title unbound/disc unbound application. When the current disc is ejected, currently running applications whose application binding is set to 00_b will continue running.
Service Unbound(1)	Service unbound Semantics for service unbound applications as defined in DVB-GEM [4] apply.	This value indicates a title unbound/disc bound application. When the current disc is ejected, the Application Manager will kill currently running applications whose application binding is set to 01_b.
Service Bound(3)	Service bound Semantics for "service bound" applications as defined in DVB-GEM [4] apply.	This value indicates a title bound/disc bound application. When the current disc is ejected, the Application Manager will kill currently running applications whose application binding is set to 11_b.

- **visibility** specifies whether the application will be visible to end users or other applications (via an application-listing API).

visibility values	description
false	This application will not be visible either to applications via an application-listing API or to users via the navigator, with the exception of any error reporting or logging facility.
true	This application will not be visible to users but will be visible to applications via an application-listing API.

- **application icon locator** is the first part of the string that specifies the location of the icon files. The icon locator should not end with a forward slash "/" (0x2F) character.

- **application icon flags**: To set this value, click select. The Select Icon Flags dialog box appears.



Select the appropriate icon flags, then click OK.

- **base directory** contains a string specifying a JAR file on the Virtual Package and a subpath within the JAR file. The string may or may not start with a forward slash character "/" (0x2F), followed by the name of the JAR file excluding the extension (e.g. "00000"), optionally followed by a string indicating a subpath in the JAR file. To indicate directories within a JAR file, use the slash character "/" (0x2F). This directory is used as a base directory for relative path names in the BD-J application, and relative paths in the classpath extension specified below. It is automatically considered to form the first directory in the class path (after the path to the system's classes). Authors are encouraged to store the initial class (see below) of the application in this directory.

Note: A JAR file that is stored in another JAR file on the Virtual Package is not considered as a sub-directory; i.e., it is considered as a normal file.

Note: As an example, "00000" indicates the root directory of 00000.jar on the Virtual Package being the base directory for the application. As another example, "00001/base" indicates the directory named "base" under the root directory of 00001.jar on the Virtual Package being the base directory of the application.

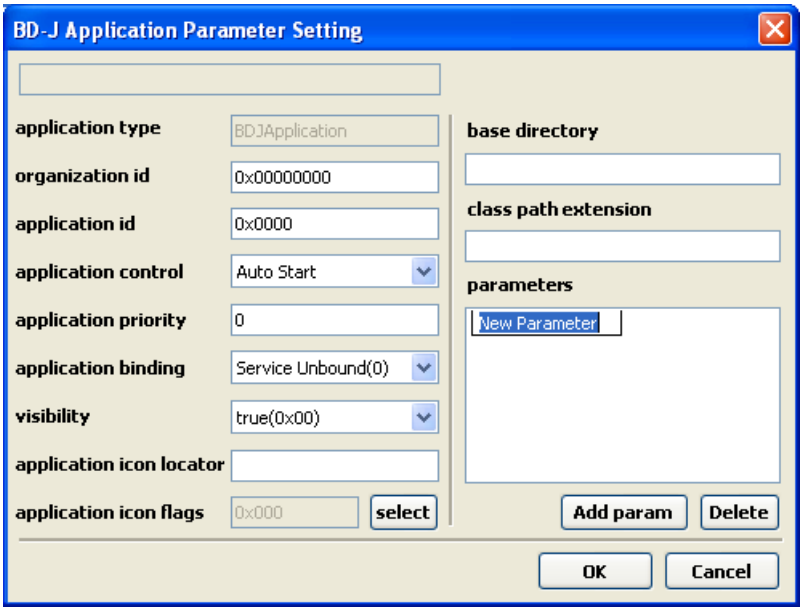
- **class path extension** This field contains a string specifying a further extension for the application class path, where the classes of the application are searched in addition to the base directory. The class path extension string is made up of a number of separate paths each indicating a directory. Each path in the string is delimited by the semicolon character ";" (0x3B). Each path may be either an absolute path or relative path. A path starting with the slash character "/" (0x2F) is interpreted as an absolute path into a JAR file on the Virtual Package. For such paths, the initial slash character "/" (0x2F) should be followed by the name of the JAR file on the Virtual Package excluding the extension (e.g., "/00002"), optionally followed by a string

indicating a subpath in the JAR file. All referenced files in the classpath will be present in the VFS. A path that does not start with the slash character "/" is interpreted as being relative to the base directory specified above. To indicate directories within a JAR file, use the slash character "/" (0x2F). The relative order of searching a class in the specified paths is as signaled in this string, starting with the first path. Note that a JAR file stored in another JAR file on the Virtual Package is not considered as a sub-directory. All referenced directories in JAR files will exist.

Note: The class path in the manifest file of a JAR file has no meaning in BD-J, and is ignored.

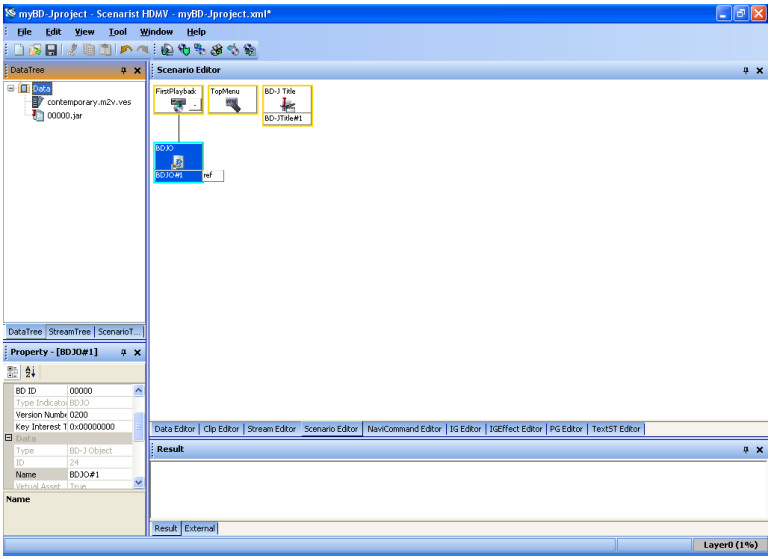
- parameters are strings that are passed to the application as parameters.

To add a parameter, click add param. A "New Parameter" placeholder appears in the parameters list box.

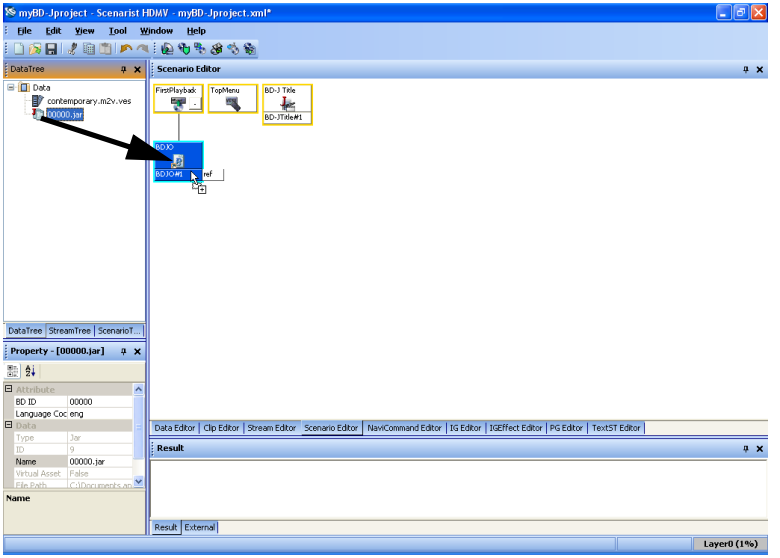


9 Click OK. The BD-J Application Parameter Setting dialog box closes.

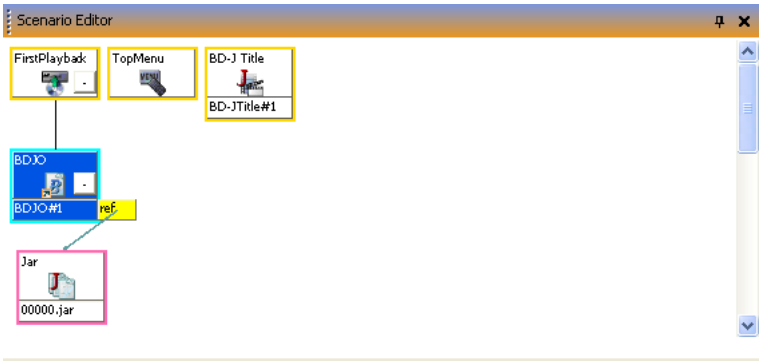
10 Select the Data Tree and the Scenario Editor.



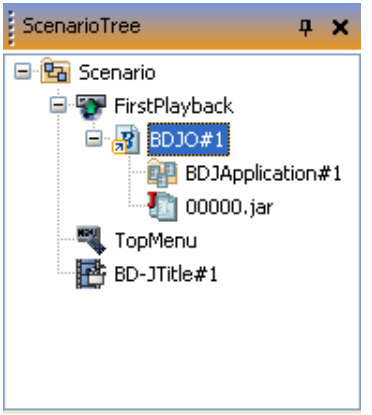
11 Drag the JAR in the Data Tree to the BDJO in the Scenario Editor.



12 The JAR appears in the Scenario Editor, linked to the BDJO.



13 The JAR also appears in the Scenario Tree.



14 Choose File > Save.

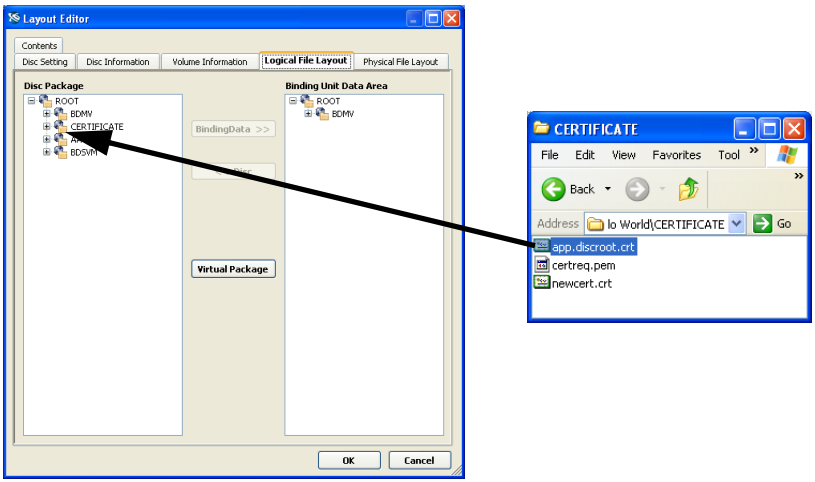
Placing the root certificate

If the JAR file containing the BD-J application has been signed, you must place the “app.discroot.crt” file in the CERTIFICATE directory of the Blu-ray Disc.

To place the root certificate:

15 In Scenarist BD, Choose Tool > Disc Layout, and select the Logical File Layout tab.

16 Locate the “app.discroot.crt” file created as part of the JAR signing process (for details, see Chapter 2 of the *Scenarist Safeguard User Guide*, “JAR signing). Drag it to the CERTIFICATE directory displayed in the Disc Package view in the Layout Editor.



17 Click OK.

18 Choose File > Save.

BD-J development with Ensequence on-Q

<<INTRO>>

Exporting Scenarist BD projects with Scenarist Bridge

18 Content protection

This chapter documents how to add AACS content protection to Scenarist BD projects. It includes the following topics:

- "AACS content protection" on page 380
- "Scenarist BD and AACS" on page 380
- "Using the CPS Editor" on page 382
- "Allocating AACS files in the disc image" on page 391

AACS content protection

AACS (Advanced Access Content System) was developed to handle the protection of content on high-definition movie titles. DVD-Video titles employed various copy protection schemes, such as CSS, APS, and CGMS. AACS is a next-generation content protection protocol that offers state-of-the-art protection for high-definition titles:

- It offers multiple layers of content protection.
- It has an encryption key size of 128 bits (as compared with 40 bits for CSS).
- It allows those who license titles for distribution to control copying, or grant rights to produce a limited number of "fair copies" from each disc.

The multiple layers of encryption that AACS provides offer unprecedented control over high-definition movie title content:

- Every AACS-compliant device has its own unique **Device Key Set**; therefore, every brand and model of AACS device can be identified.
- The Device Key Set is used to decrypt **Media Key Blocks**; Media Key Blocks can be updated to revoke certain devices.
- Media Key Blocks are used to compute **Media Unique Keys**, and Media Unique Keys are used to decrypt the actual media content.

Scenarist BD and AACS

Whenever you create an authoring project, the newest version of Scenarist BD automatically generates AACS files for the project (including the Duplicate files required by AACS protocols). You edit these files and set AACS-related values using the CPS (Content Protection System) Editor. You can also export information files that contain CPS Unit information; these same information files can then be imported into other authoring projects.

AACS Files

For single-layer discs, Scenarist BD creates the following AACS files:

Content000.cer
ContentHash000.tbl
ContentRevocation.lst
CPSUnit00001.cci
mcmf.xml
MKB_RO.inf
MKB_RW.inf
Unit_Key_RO.inf

For dual-layer discs, Scenarist BD creates the following AACS files:

Content000.cer
Content001.cer
ContentHash000.tbl
ContentHash001.tbl
ContentRevocation.lst
CPSUnit00001.cci
mcmf.xml
MKB_RO.inf
MKB_RW.inf
Unit_Key_RO.inf

Note: For both single-layer and dual-layer discs, there will be one CPSUnit file for each Clip Unit in the project.

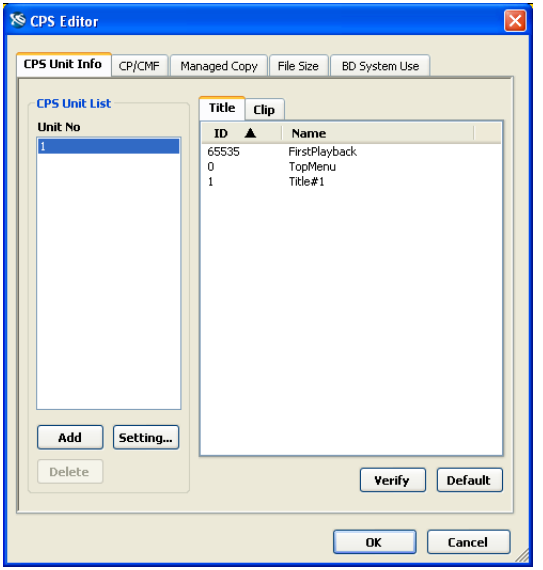
Project file compatibility

Any authoring project CP/CMF settings and AACS files created using earlier versions of Scenarist BD are ignored when you use the newest version of the application to open the project file. All AACS-related files and settings will be newly created with the default parameter values. This means that AACS files manually added by users with previous versions of Scenarist BD will be removed from AACS folder, and replaced by newly created AACS files. Therefore, the AACS folder in Layout Editor looks the same, but the files themselves are different, and have default parameter values.

Using the CPS Editor

To edit AACS settings using the CPS Editor:

1 Choose Tool > CPS. The CPS Editor appears, with the CPS Unit Info tab showing.



Note: The CPS Editor tabs are as follows:

- **CPS Unit Info tab,** which allows you to set CPS Unit values.
- **CP/CMF tab,** which allows you to set basic CP/CMF values.
- **Managed Copy tab,** which allows you to set managed copy protection values.
- **File Size tab,** which is reserved for future use.
- **BD System Use tab,** which is used to configure BD+ settings.

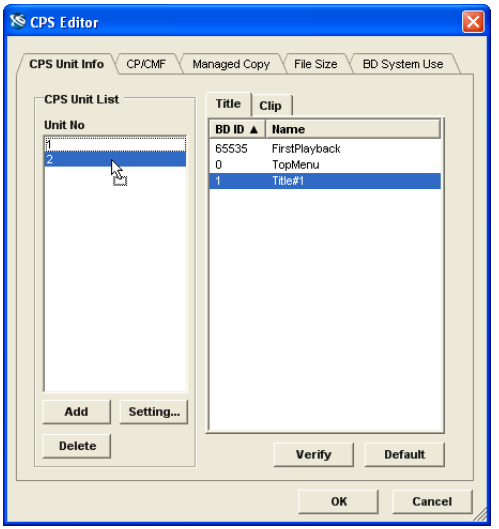
2 Click Verify. Also, check that the CPS Unit List is correct, with all Titles and Clips accounted for,

3 To add a CPS Unit to the CPS Unit List, click Add.

4 To delete a CPS Unit from the CPS Unit List, select the Unit number to be deleted; then click Delete.

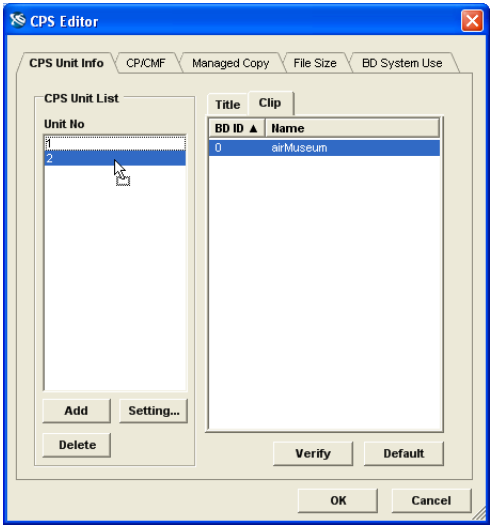
5 To register a Title in a CPS Unit, do the following:

- Choose the Title tab.
- Select the Title to be registered.
- Drag and drop it to the CPS Unit in which you want it registered.

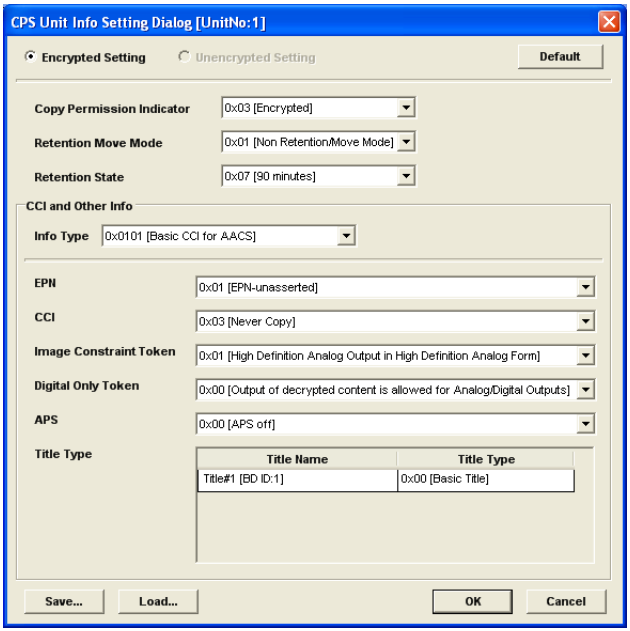


6 To register a Clip in a CPS Unit, do the following:

- Choose the Clip tab.
- Select the Clip to be registered.
- Drag and drop it to the CPS Unit in which you want it registered.



7 To edit CPS Unit settings, select the first Unit number from the CPS Unit List; then click Setting. The CPS Unit Info Setting dialog box appears.



Note: The settings for **Copy Permission Indicator**, **Retention Move Mode,** and **Retention State** are the only possible values for encrypted settings, and **Encrypted Setting** is the only available mode in this dialog box.

8 Select appropriate settings in the CCI and Other Info group box.

- **EPN** sets the status of Encryption Plus Non-assertion.

numerical value	setting
0x00	EPN-asserted.
0x01	EPN-unasserted.

- **CCI** is the Copy Control Information setting.

numerical value	setting
0x00	Copy Control Not Asserted.
0x02	Copy One Generation.
0x03	Never Copy.

- **Image Constraint Token** sets the form for the HD analog output.

numerical value	setting
0x00	High Definition Analog Output in the form of Constrained Image.
0x01	High Definition Analog Output in High Definition Analog Form.

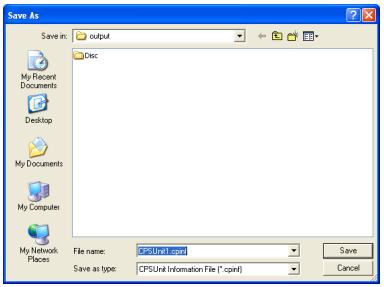
- **Digital Only Token** determines whether output of decrypted content is allowed for analog/digital outputs, or just for digital outputs.

numerical value	setting
0x00	Output of decrypted content is allowed for Analog/Digital Outputs.
0x01	Output of decrypted content is allowed only for Digital Outputs.

- **APS** sets the type of analog copy protection.

numerical value	setting
0x00	APS off.
0x01	APS1 on: type 1 (AGC).
0x02	APS1 on: type 2 (AGC + 2L colourstripe).
0x03	APS1 on: type 3 (AGC + 4L colourstripe).
0x06	APS2 on.
0x07	APS2 on.

9 To save the CPS Unit information, click Save. The Save As dialog box appears.



10 Select a location for the information file; then click Save.

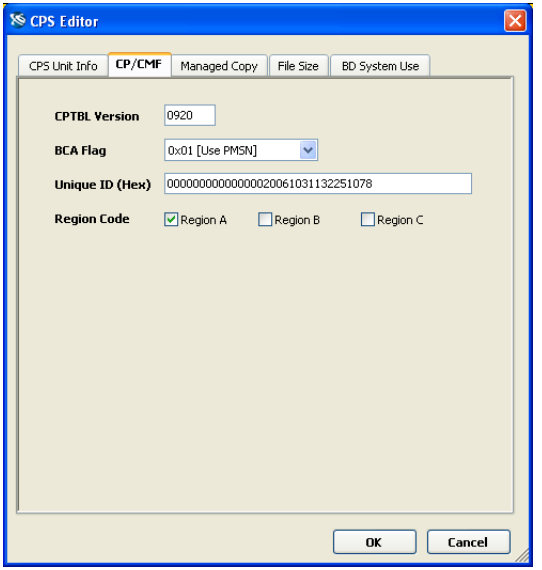
11 Click OK. The CPS Unit Info Setting dialog box closes.

12 Using the procedure outlined in steps 7-11 above, edit settings for all CPS Units in the CPS Unit List.

13 To import a CPS Unit Information file, do the following:

- In the CPS Unit List, elect the Unit number to which you wish to import the information file; then click Setting.
- Click Load. The Open dialog box appears.
- Locate the information file you wish to import; then click Open.

14 Choose the CP/CMF tab in the CPS Editor.



15 Select or enter appropriate CP/CMF settings.

- **CPTBL Version** is the version of the Copy Protection table being used by the application. In most situations, you should use the default value.
- **BCA Flag** shows whether or not there is data in the Burst Cutting Area. In most situations, you should use the default value.

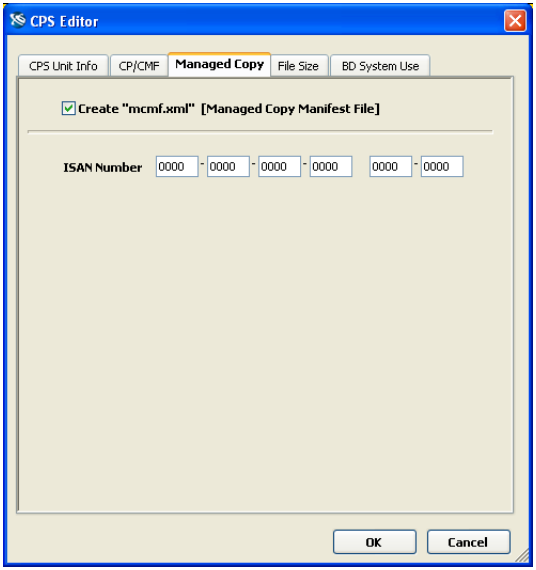
numerical value	setting
0x00	[No data exists.] No PMSN.
0x01	[Data exists.] Use PMSN.

Note: PMSN = Pre-recorded Media Serial Number.

- **Unique ID (Hex)** is the unique ID for the disc volume. The default value is a time stamp (year, month, date, hour, minute, second, millisecond). In most situations, you should use the default value.

16 Select the appropriate Region Code(s).

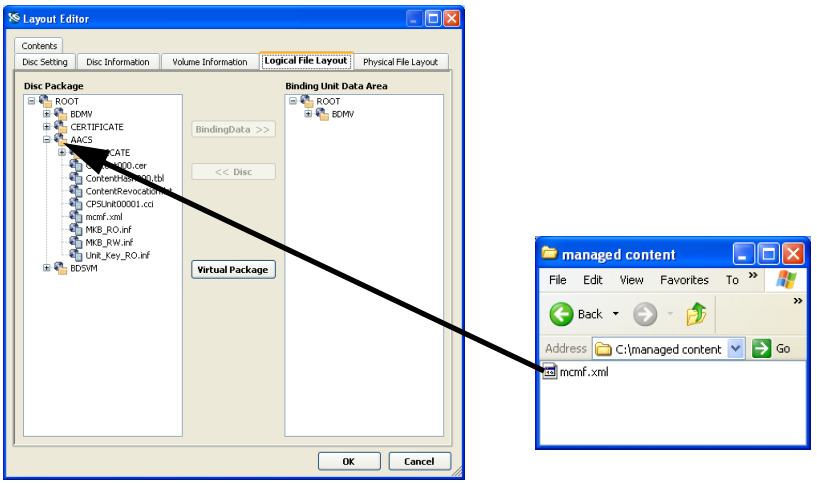
17 Choose the Managed Copy tab in the CPS Editor.



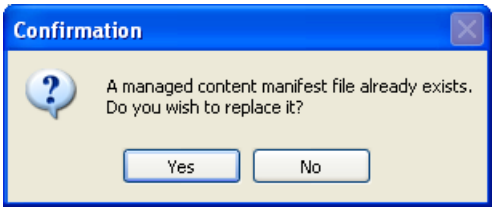
18 If there is an ISAN (International Standard Audiovisual Number) associated with your project, enter it in the ISAN Number fields.

19 If you want to add your own Managed Copy Manifest File (mcmf.xml) to specify the Managed Content URL for the project, click the Create "mcmf.xml" checkbox to uncheck (deselect) the option.

Note: To add your own mcmf.xml to the project, choose Tool > Disc Layout. In the Layout Editor Window, select the Logical File Layout tab. Drag and drop your Managed Copy Manifest File into the AACS folder in the Disc Package tree view:



If a Managed Content Manifest File already exists, the program asks you to confirm that you want to replace it.



Click Yes to add your mcmf.xml file to the project; then click OK to close the Layout Editor.

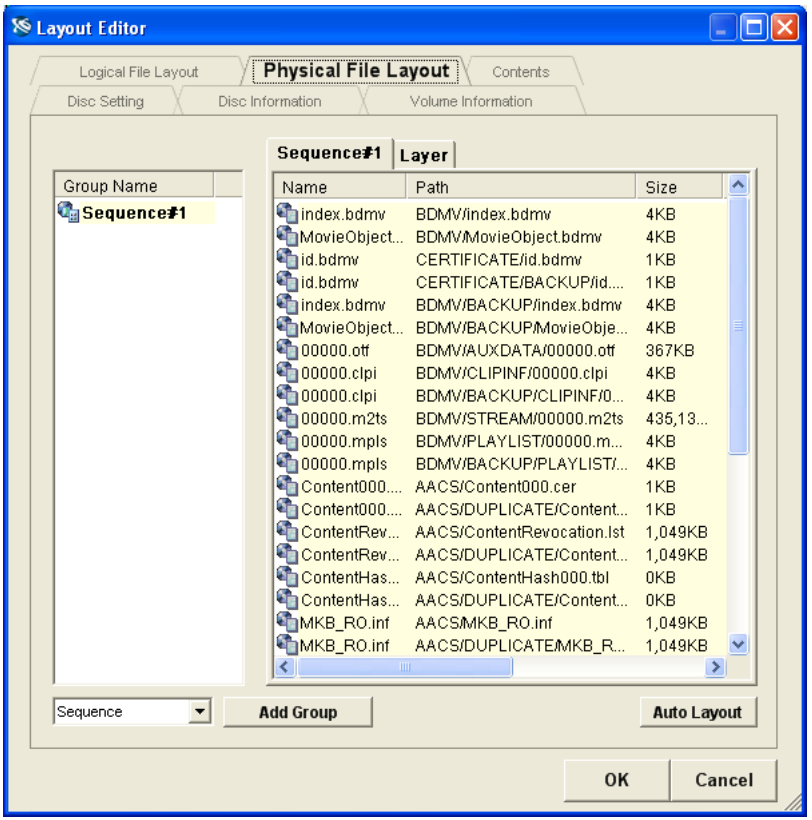
20 In the CPS Editor, click OK to save your AACS-related settings.

Allocating AACS files in the disc image

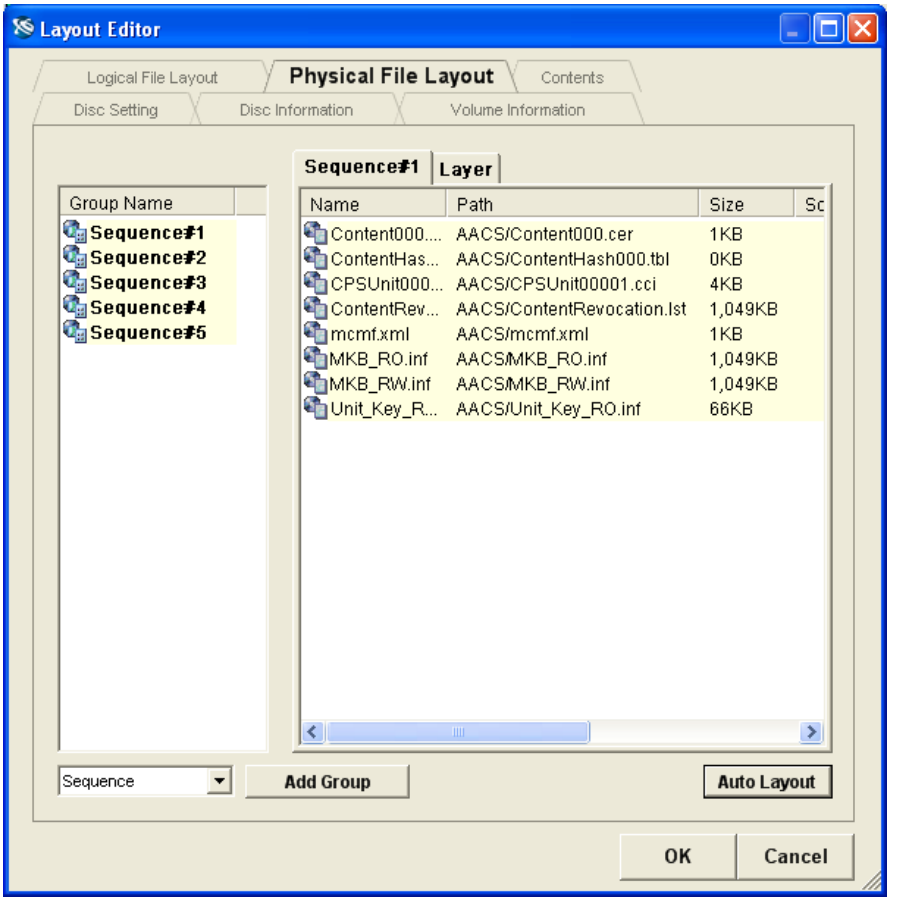
In order for AACS files to function properly, they must be allocated in the disc image according to the AACS format. Since the AACS format defines rules of physical file allocation in the disc image, you should allocate AACS files before multiplexing to be compliant with the AACS spec.

To allocate AACS files in the disc image:

1. Choose Tool > Disc Layout. the Layout Editor appears.
2. Choose the Physical File Layout tab.



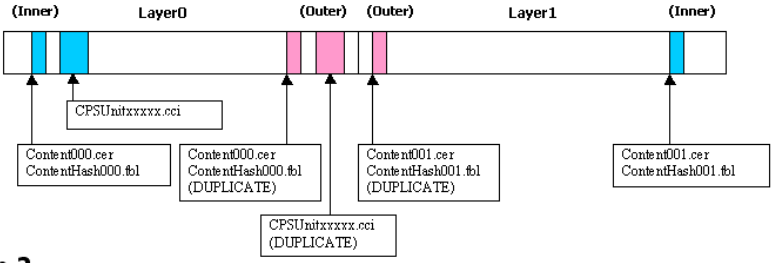
3 Click Auto Layout to move the AACS files to their proper locations automatically. The Auto Layout function groups and organizes the files into logical sequences. For example (single layer):



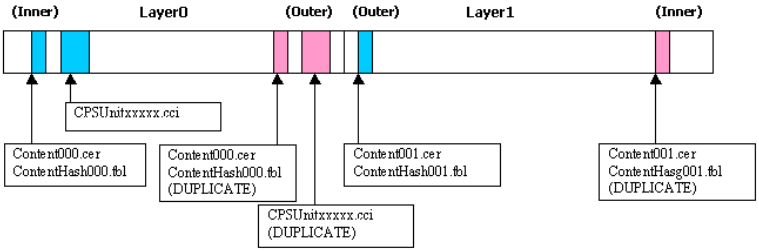
Note: For single-layer discs, the AACS files belong in the inner position of the disc, and the AACS/Duplicate files belong in the outer position of the disc.

Note: For dual-layer discs, there are two acceptable patterns:

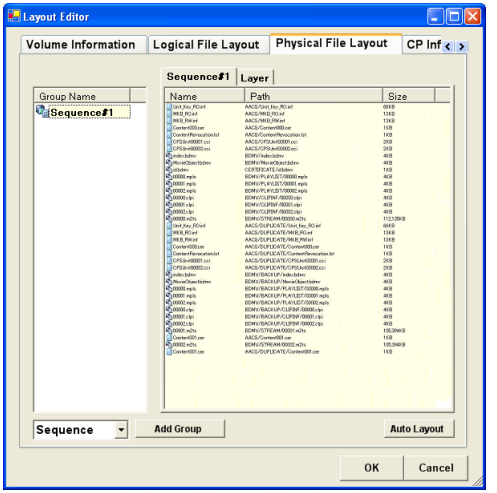
Pattern 1



Pattern 2



Make sure to locate AACS/Content000.cer and AACS/Duplicate/Content000.cer in Layer 0, and locate AACS/Content001.cer and AACS/Duplicate/Content001.cer in Layer 1. Also, make sure to locate AACS/ContentHash000.tbl and AACS/Duplicate/ContentHash000.tbl in Layer 0, and locate AACS/ContentHash001.tbl and AACS/Duplicate/ContentHash001.tbl in Layer 1. For example (Pattern 2):



Note: If you use the Auto Layout function, the application overwrites any file layout created manually. You can troubleshoot and adjust the layout manually after you use the Auto Layout function. To delete Sequences, use the Delete key (not the backspace key). To view the files in order (from the beginning of the disc to the end), click the Layer tab.

4 Check to make sure that any streams that need to connect seamlessly are placed adjacent to one another, and are in the correct order within the physical layout of the disc.

5 Click OK to save your physical layout settings and close the Layout Editor.

Your project is now ready to be multiplexed in preparation for final output. For more information, see “Multiplexing” on page 396.

19 Multiplexing and output

This chapter documents how to multiplex and create a final CMF output image for your Scenarist BD project. It includes the following topics:

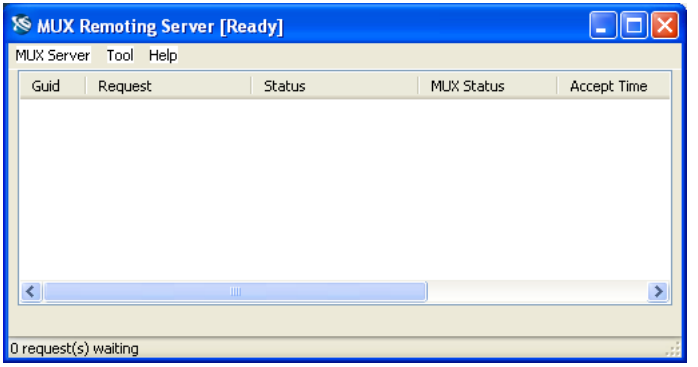
- "Multiplexing" on page 396
- "Final CMF Output" on page 404

Multiplexing

Once a Scenarist BD project is completed and the AACS setting are entered, you can multiplex it in preparation for final output. Multiplexing, or *MUXing*, is the process of writing the completed video, audio, and graphic streams. Multiplexing takes place in the MUX Remoting Server, which is called by Scenarist BD, and outputs a BDMV Volume containing the video object files and information files that will reside on the mastered disc.

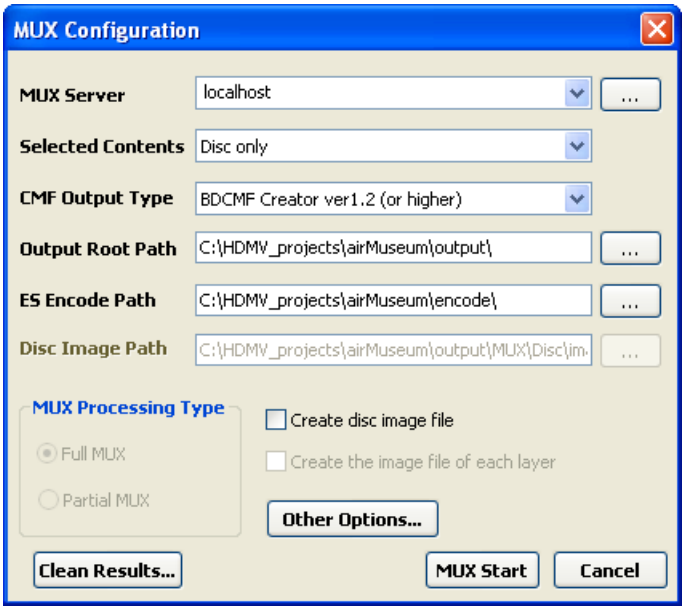
To multiplex a project:

1. In Scenarist BD, choose File > Save Project to save the project.
2. From the Windows Start menu, choose All Programs > Sonic > Scenarist BD > Utilities > Mux Remoting Server. The MUX Remoting Server launches.



3. In Scenarist BD, choose Tool > MUX, or click the MUX button in the toolbar.

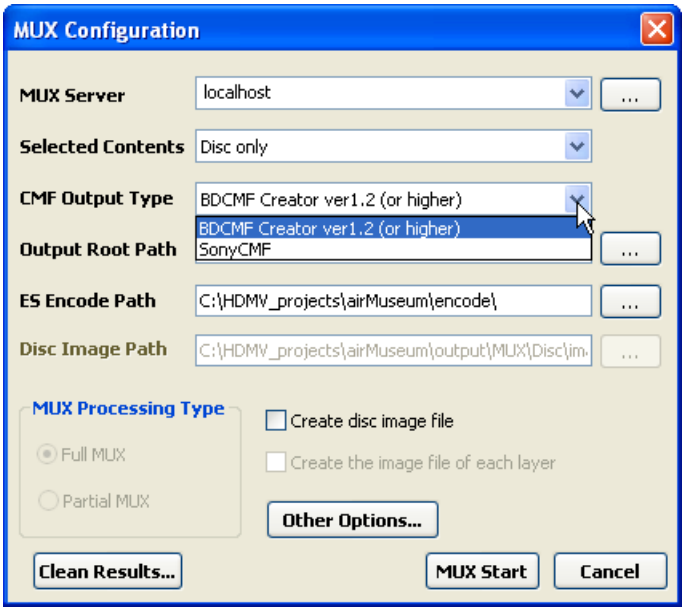
The MUX Configuration dialog box appears.



4 Using the drop-down list, set the MUX Server to localhost.

5 Using the drop-down list, set the Selected Contents to Disc only.

6 In the CMF Output Type field, select output type using the drop-down list. In general, you should use the "BDCMF Creator ver1.2 (or higher)" option. The SonyCMF option should only be used if you are using a Sony replication plant.

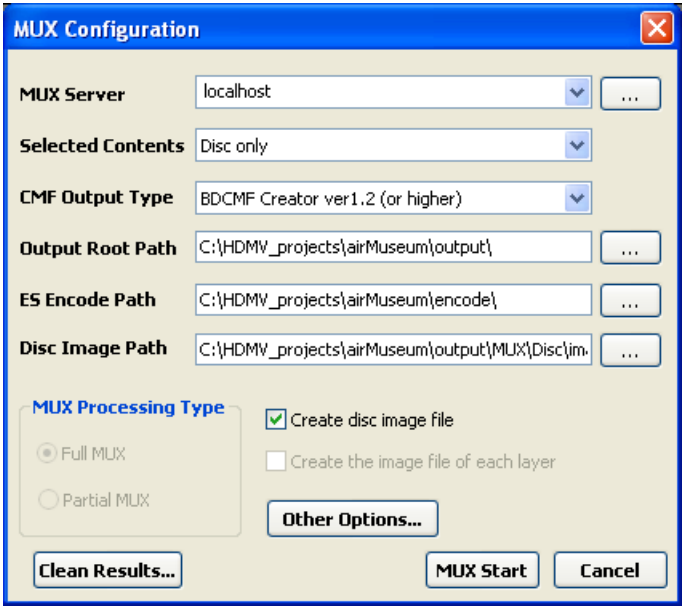


Note: The "BDCMF Creator ver1.2 (or higher)" option is used in conjunction with the BDCMF Creator utility to generate BDCMF output.

7 The Output Root Path and ES Encode Path are set by default to the paths that were defined when you created the project. If appropriate, select new output paths by clicking the Browse buttons and selecting new output folders.

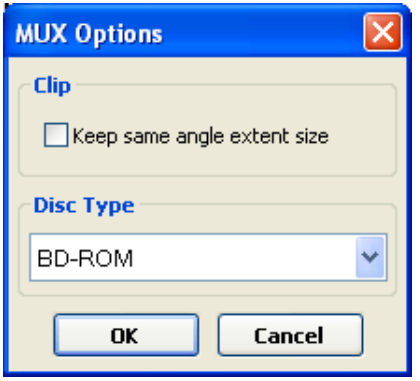
Note: In most situations, the default paths should be retained.

8 Check the “Create disc image file” option to create the disc image. (If your project is dual-layer, the “Create the image file of each layer” option is still grayed out, but is default selected.) If you select the “Create disc image file” option, the Disc Image Path field becomes active.

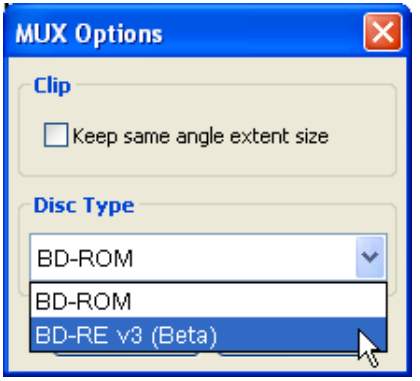


Note: In most situations, the default path should be retained.

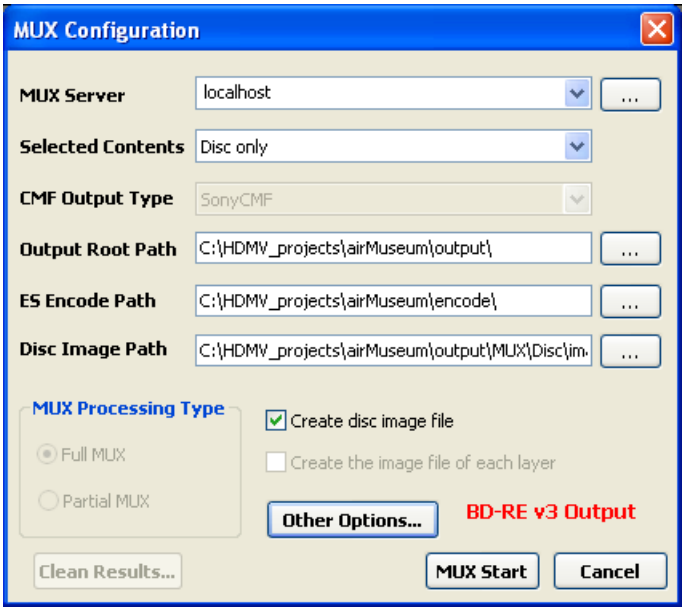
9 If your are using BD-RE (Blu-ray Disc Rewritable), click Other Options. The MUX Options dialog box appears.



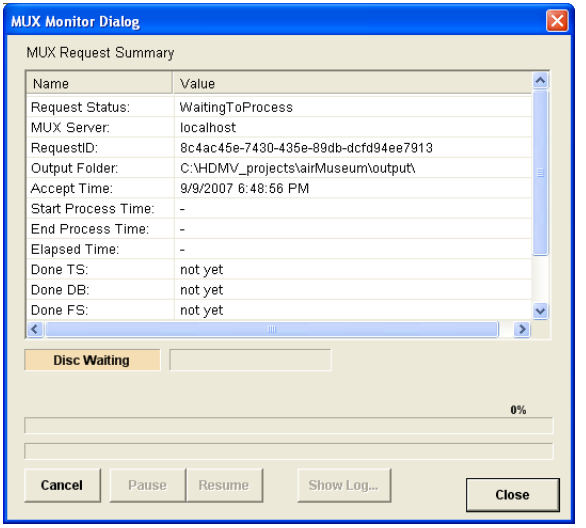
10 Using the drop-down list, select BD-RE (Beta).



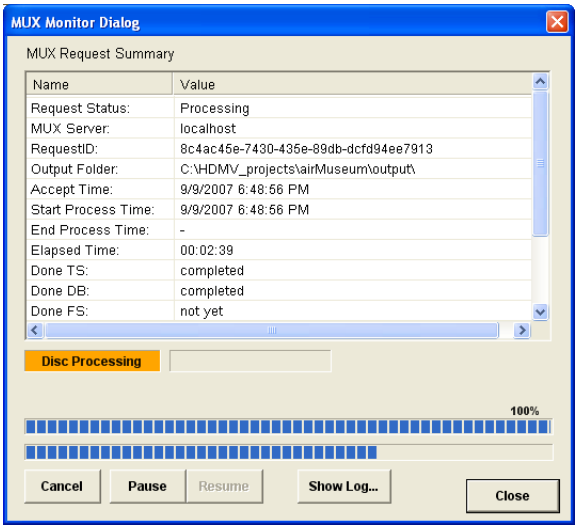
11 Click OK. The BD-RE option you have selected appears in red in the MUX Configuration dialog box.



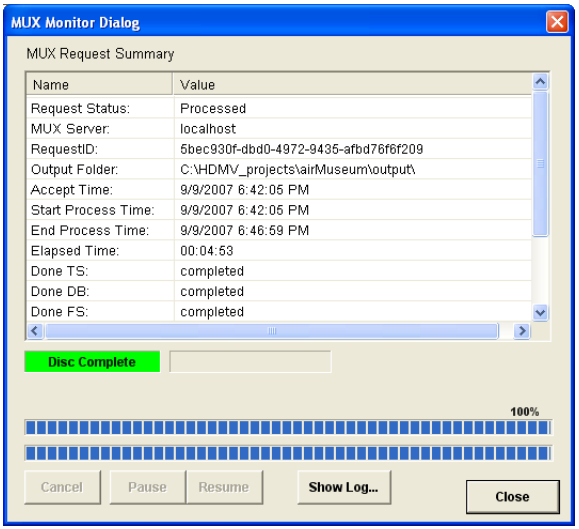
12 Click MUX Start to begin multiplexing the project. The MUX Monitor dialog box appears.



13 The Monitor shows you the progress of the MUX operation.



14 The Monitor also tells you when the MUX process is complete.



15 Click Close to close the MUX Monitor dialog box.

16 In the MUX Remoting Server application, choose MUX Server > Exit.

17 When prompted to confirm you want to exit the MUX Server, click Yes.

18 Choose File > Save Project to save the project.

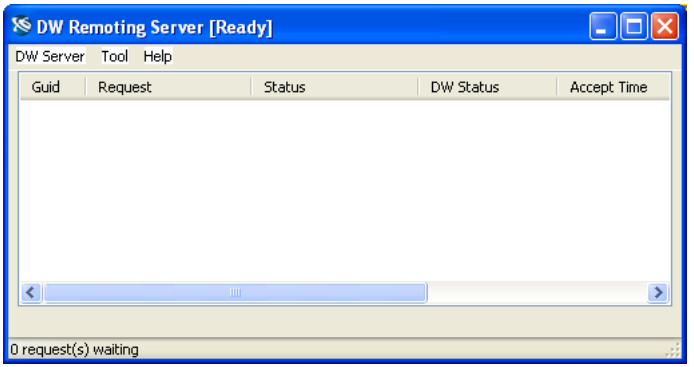
Final CMF Output

Once you have multiplexed your project (for details, see “Multiplexing” on page 396), you are ready to create the final CMF (Cutting Master Format) image.

Note: The current version of Scenarist BD supports the Sony CMF format. The Sony CMF format can be converted to BD CMF format using the BDCMF Creator utility.

To create a final CMF image:

1 From the Windows Start menu, choose All Programs > Sonic > Scenarist BD > Utilities > DW Remoting Server. The DW Remoting Server launches.



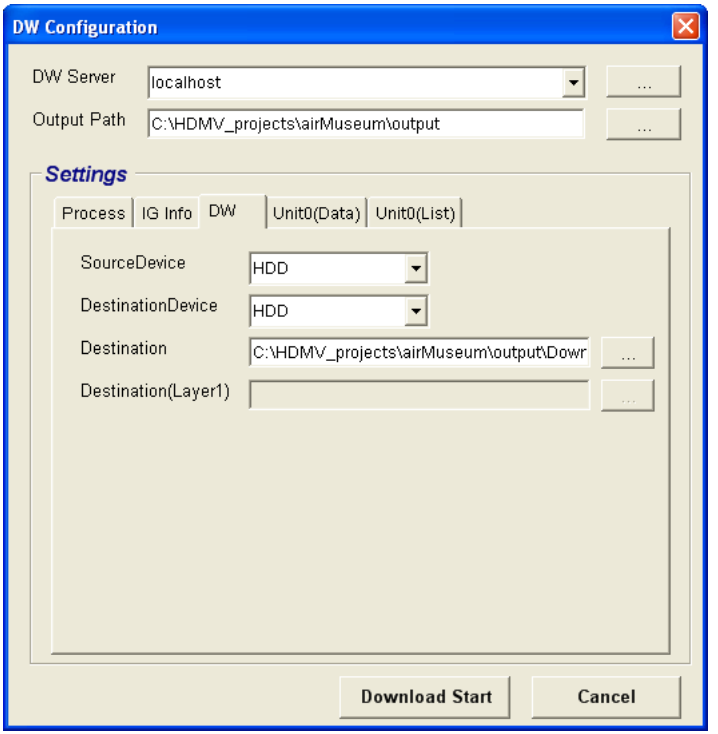
2 In Scenarist BD, choose Tool > Download, or click the Download button in the toolbar.

The DW Configuration window appears.

3 Using the drop-down list, set the DW Server to localhost.

Note: By default, the Output Path is set to the Output folder used by the project, and should not be changed.

4 Click the DW tab.

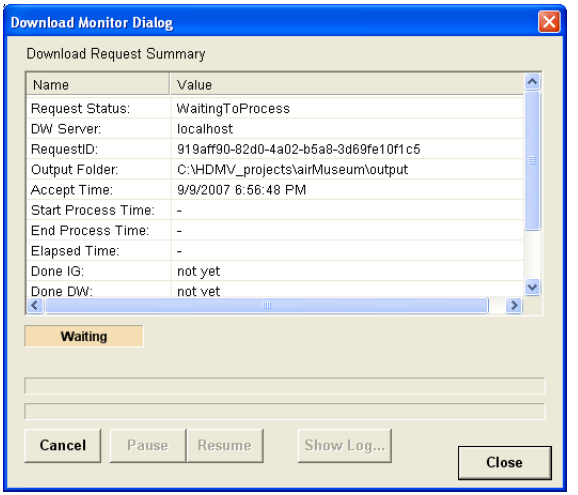


5 Using the drop-down lists, set Source Device and Destination Device to HDD.

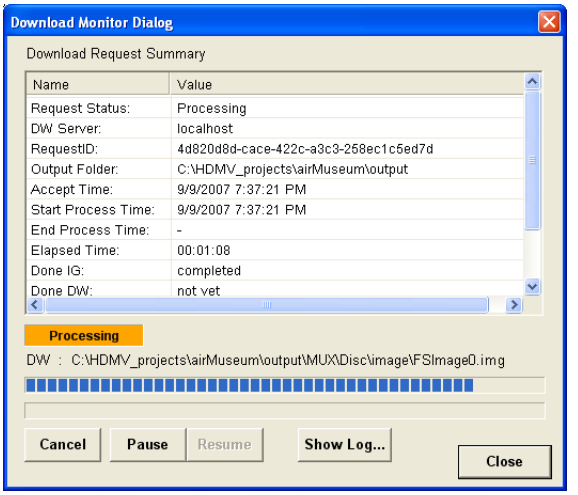
6 Verify the Destination path, and the Destination(Layer1) path if your project is dual layer.

7 If appropriate, adjust any other CMF settings in the Process, IG Info, Unit0(Data), and Unit0(List) tabs.

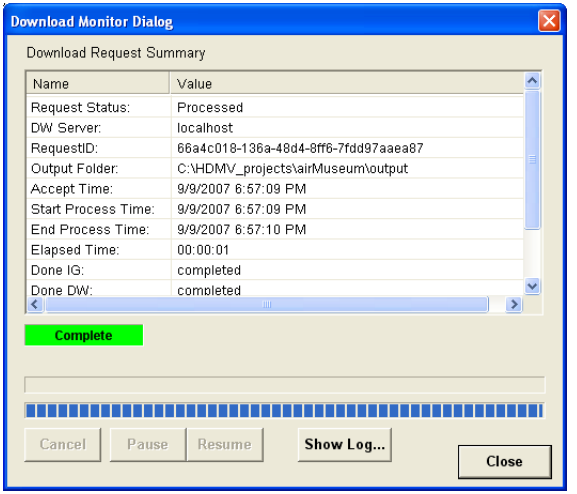
8 Click Download Start to begin downloading the project. A Download Monitor dialog box appears.



9 The Monitor shows you the progress of the download operation.



10 The Monitor also tells you when the download process is complete.



Note: Once the download process is finished, your destination directory will contain a CMF image with supporting .DAT files.

11 Click Close to close the Download Monitor dialog box.

12 In the DW Remoting Server application, choose DW Server > Exit.

13 When prompted to confirm you want to exit the DW Server, click Yes.

14 If you are using the SonyCMF format, sent the DST folders (C:\HDMV_projects\<ProjectName>\Output\Download\DST) to the plant. If the plant does not accept SonyCMF, use the BDCMF Creator utility to generate a BDCMF output.

20 Save As options and archiving

This chapter documents the Save as options offered by Scenarist BD, and tells you how to make a compressed archive file of your project. It includes the following topics:

- "Save As options" on page 410
- "Archiving" on page 420

Save As options

As with many other applications, Scenarist BD offers a simple Save As function, which allows you to create an alternate version of the (.xml) project file and make minor changes to it. This new project file references the same Encode and Output folders as the original project file.

If you want to make more extensive changes to the project, including replacing IG and PG assets, Scenarist BD offers a Save As New Project function. This operation saves the Encode and Output folders along with the new (.xml) project file, rather than referencing the folders associated with the original project file.

The following sections document the use of Scenarist BD's Save As options:

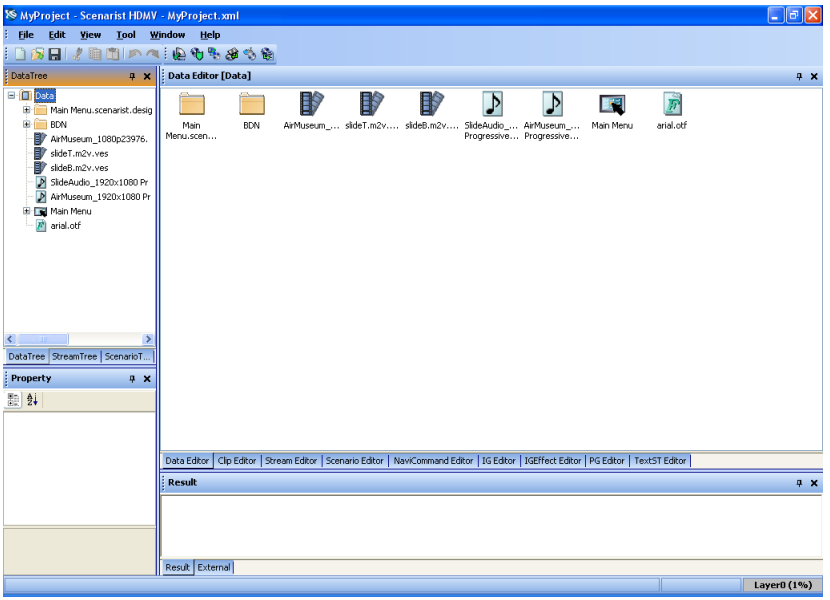
- "Save As" on page 411
- "Save As New Project" on page 415

Save As

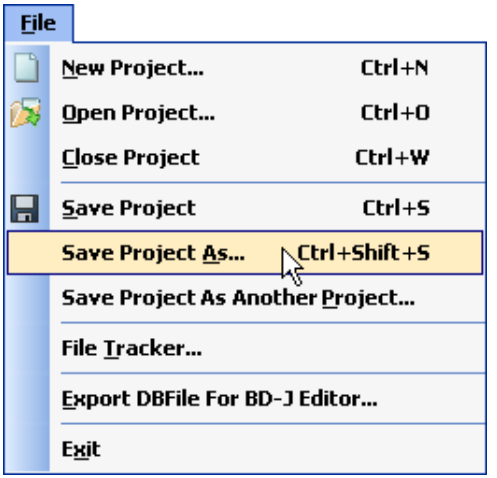
The Save As option allows you to save a new version of the Scenarist BD (.xml) project file. This new project file is tied to the same Encode and Output folders as the original project file.

To use the Save As option:

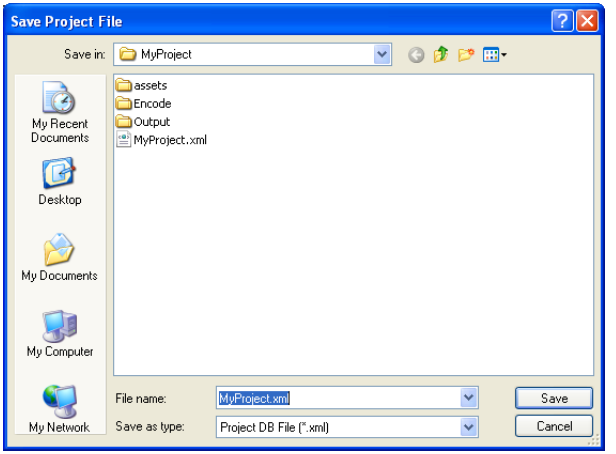
1 Open your project in Scenarist BD.



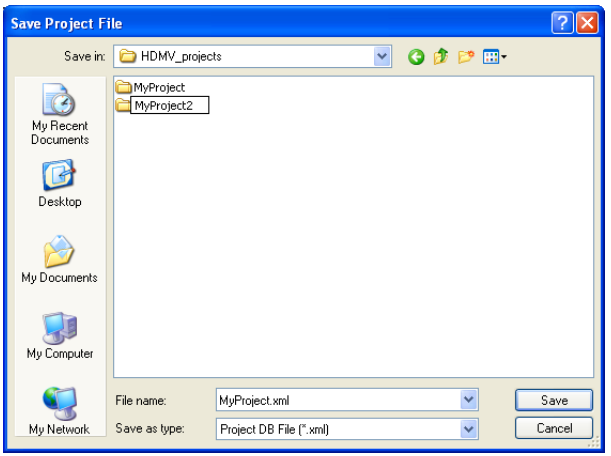
2 Choose File > Save As.



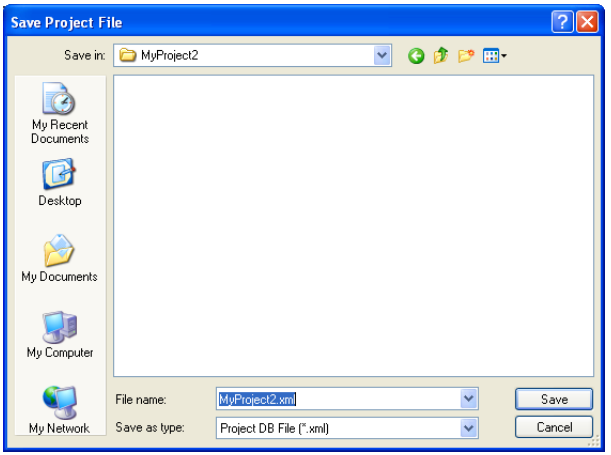
The Save Project dialog box appears.



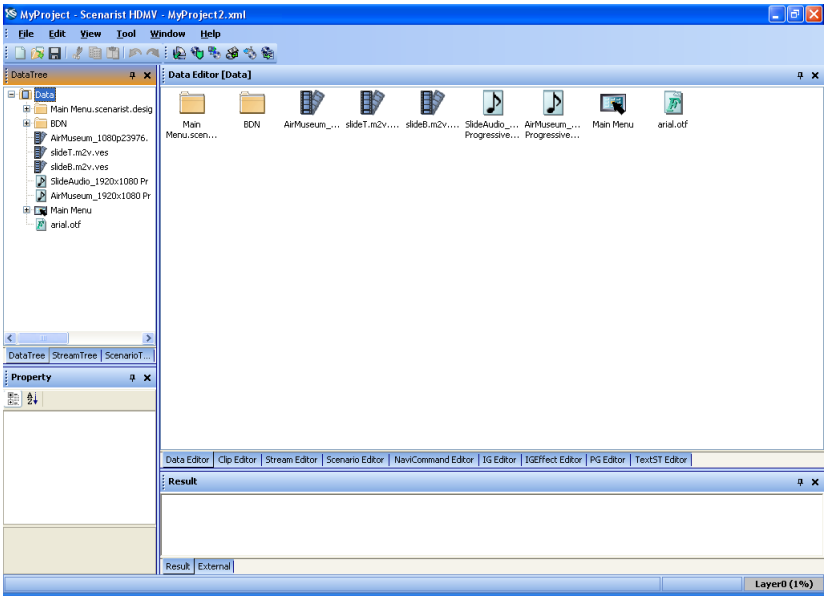
3 Select a location for your project file, and (if appropriate) create a folder for it.



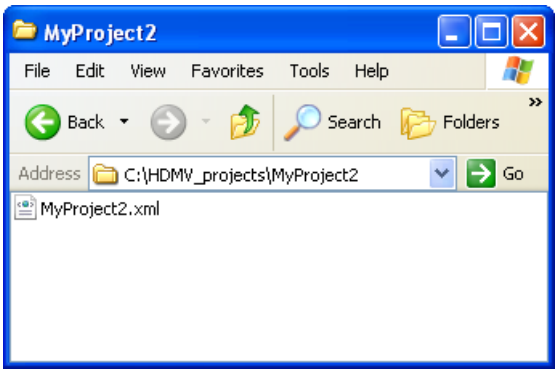
4 Select the new folder you have created, and enter a name for the (.xml) project file.



5 Click Save. The project, with its new name, appears in Scenarist BD.



Only the new (.xml) project file is saved in the new location.



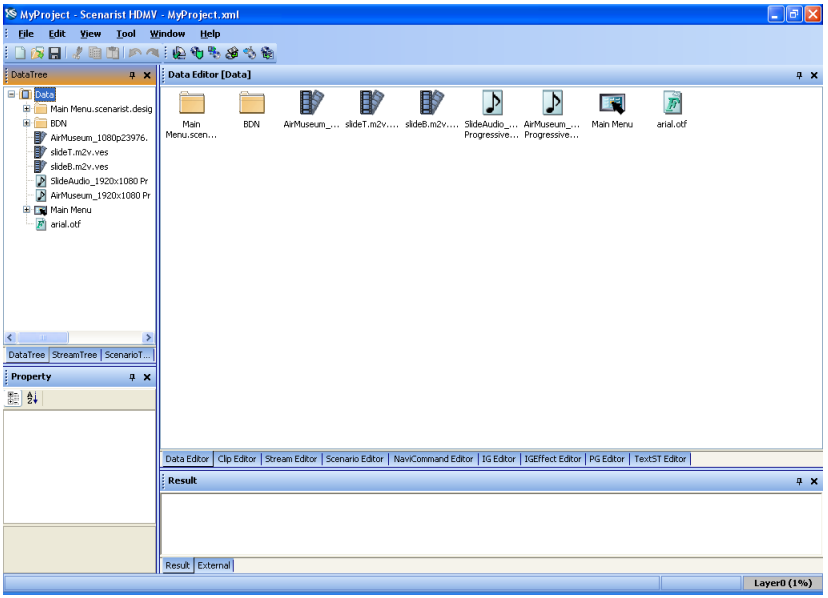
This new project file references the Encode and Output folders of the project that was open in Scenarist BD before the Save As operation.

Save As New Project

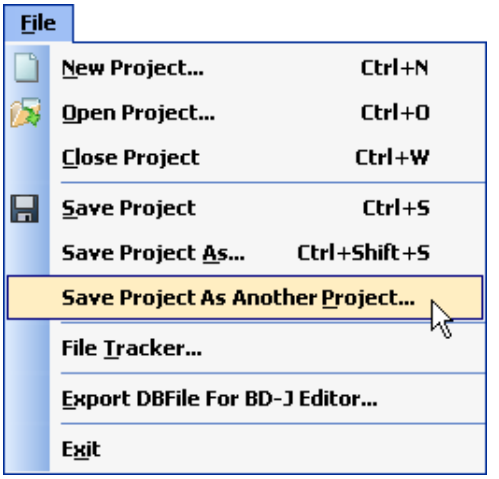
The Save As New Project option allows you to save a new version of the Scenarist BD (.xml) project file, and associate that file with new Encode and Output folders (rather than simply referencing the folders tied to the original project file).

To use the Save As New Project option:

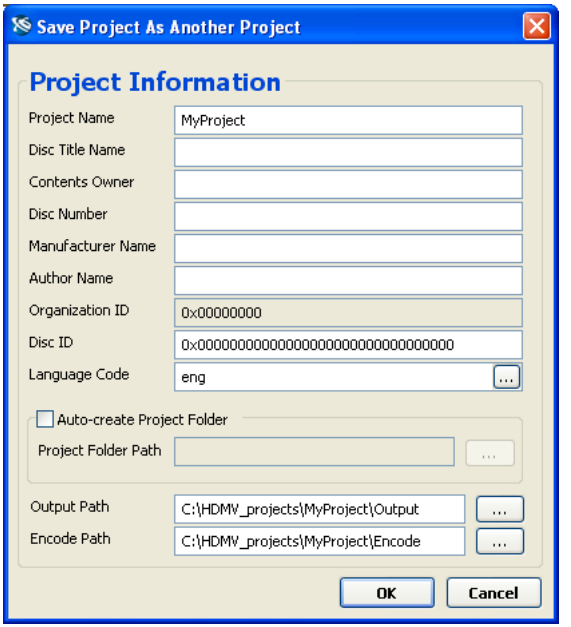
1 Open your project in Scenarist BD.



2 Choose File > Save As New Project.



The Save Project As Another Project dialog box appears.



3 Enter a name for the (.xml) project file.

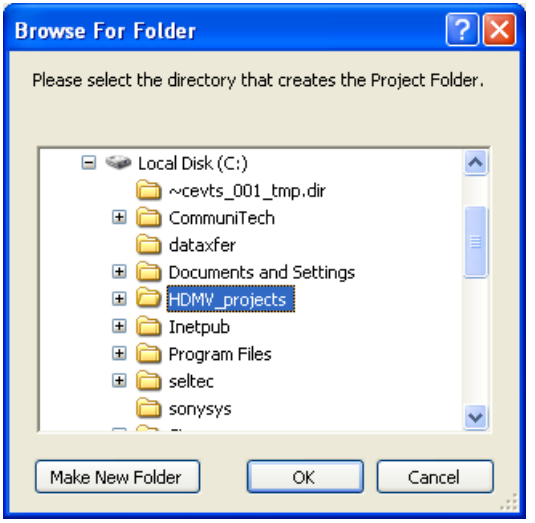
4 Enter optional data into the following fields:

- Disc Title Name
- Contents Owner
- Disc Number
- Manufacturer Name
- Author Name
- Organization ID (this is a read-only field)
- Disc ID

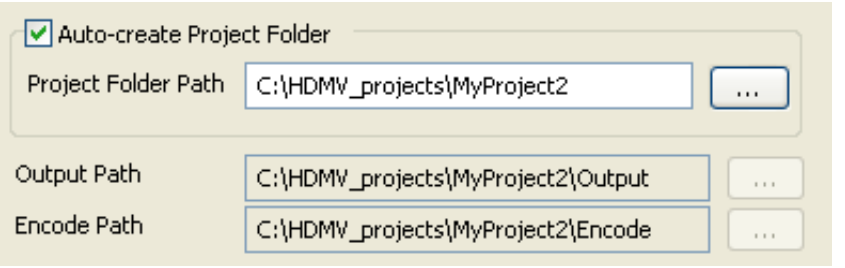
5 If appropriate, select a new default Language Code for the project.

6 Select the Auto-create Project Folder option. The Project Folder Path field becomes active, and the Browse For Folder dialog box appears.

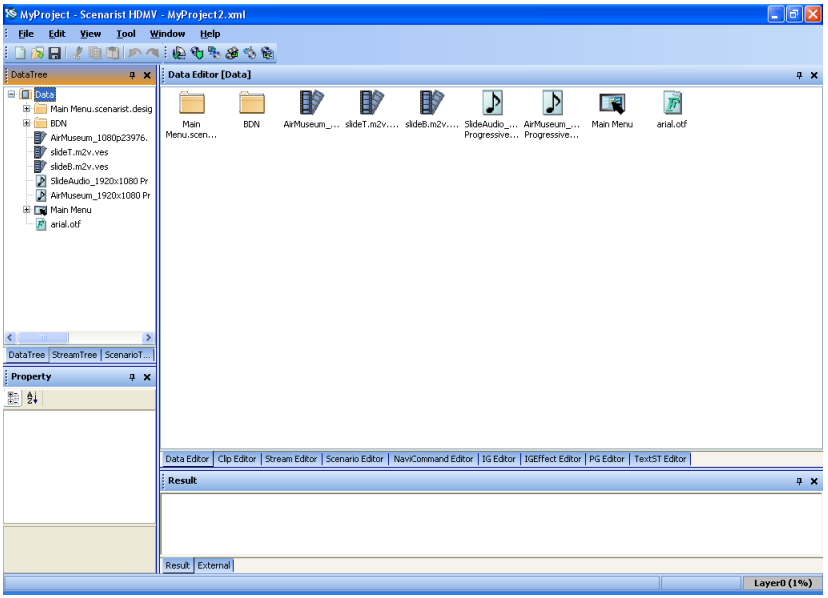
7 Select the location for the new project folder.



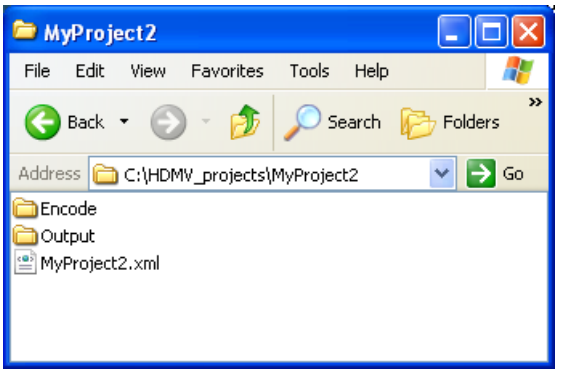
8 Click OK. The path to the new project folder appears in the Project Folder Path field, and the paths to the new Output and Encode folders appear in those (grayed-out) fields.



9 Click OK. The project, with its new name, appears in Scenarist BD.



New Encode and Out put folders are saved in the new location, along with the new (.xml) project file.



Archiving

Using Scenarist BD's archive feature, you can create a compressed archive file of your project. This allows you to create a backup of your project, and makes it easy to move your project to another computer or location.

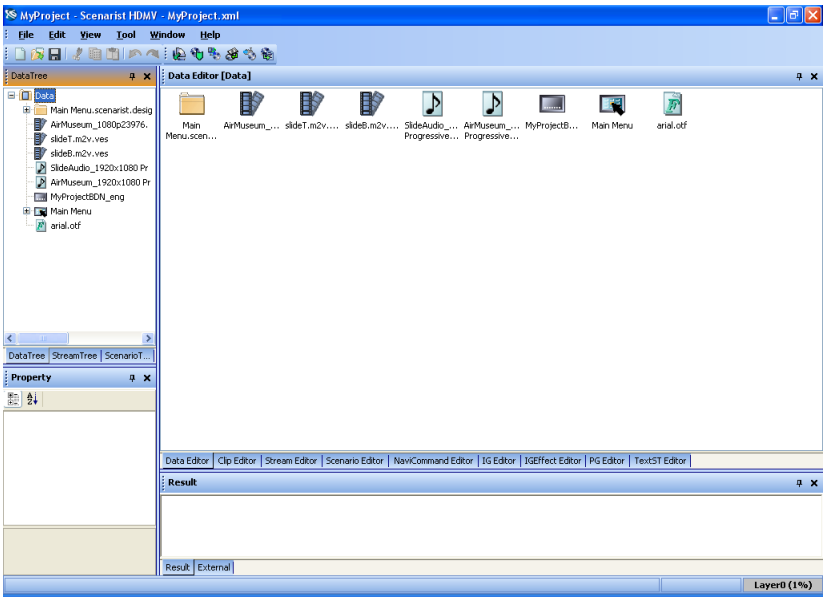
The following sections document the use of Scenarist BD's archive function:

- "Archiving a project" on page 420
- "Extracting an archived project" on page 425

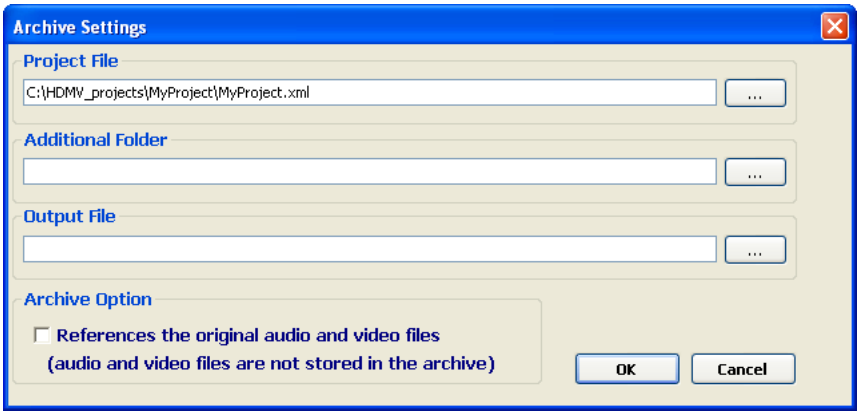
Archiving a project

To archive a project:

1 Open your project in Scenarist BD.



2 Choose Tool > Archive. The Archive Settings dialog box appears.



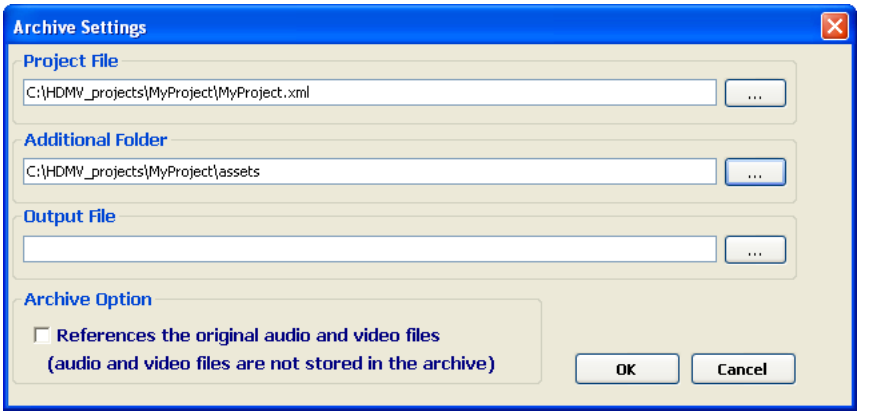
The Project File field shows the path to the open project file.

3 Click the Browse button to the right of the Additional Folder field. The Browse for Folder dialog box appears.

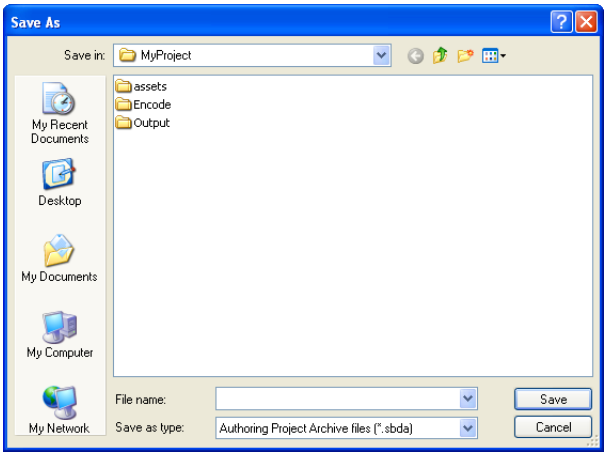
4 If appropriate, select an additional folder that you want to have saved as part of your archive.

Note: All folders that are created as part of the project, and all folders that are imported into the project, are automatically included in the archive.

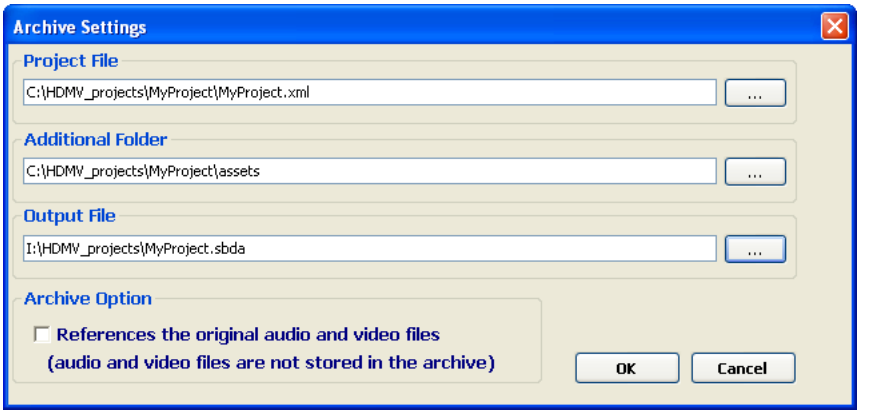
5 Click OK. The path to the selected folder appears in the Additional Folder field.



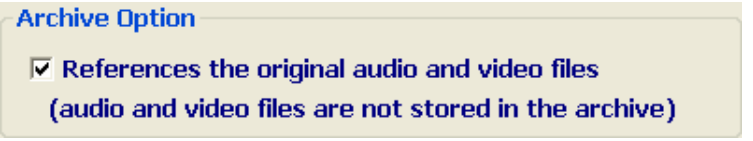
6 Click the Browse button to the right of the Output File field. The Save As dialog box appears.



7 Select the location and name for your archive file; then click Save. The path to the archive file appears in the Output File field.

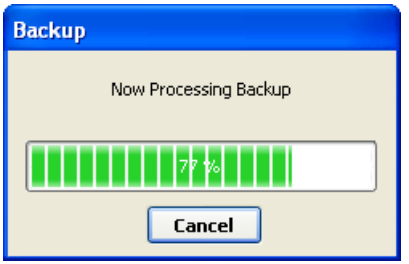


8 If appropriate, select the "References the original audio and video files" option in the Archive Option group box.

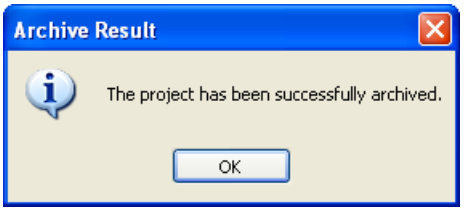


Note: If you select this option, audio and video files are included in the project by reference only: The file paths for the audio and video streams (as saved in the archived and extracted project) will not been changed to point to a new destination folder when you extract the project. If you do not select this option, the audio and video files themselves are included in the archive, and will reside in the destination folder when the project is extracted.

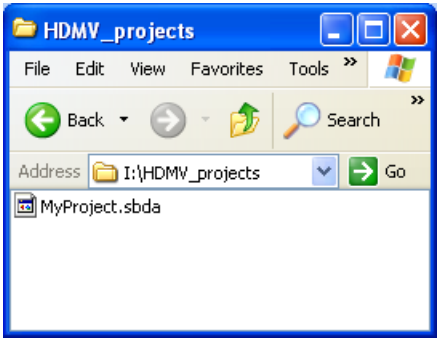
9 Click OK. Scenarist BD creates the archive. The program shows you the progress of the backup operation.



10 When the backup operation is finished, an Archive Result dialog box appears.



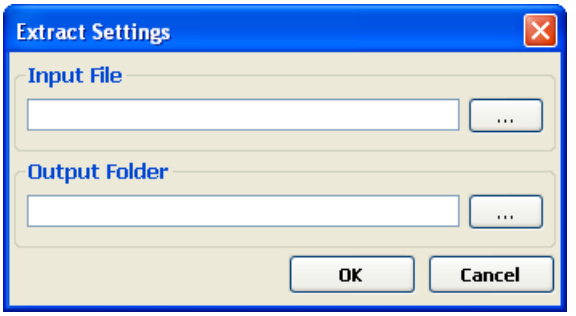
11 Click OK. The selected location folder contains the archive file.



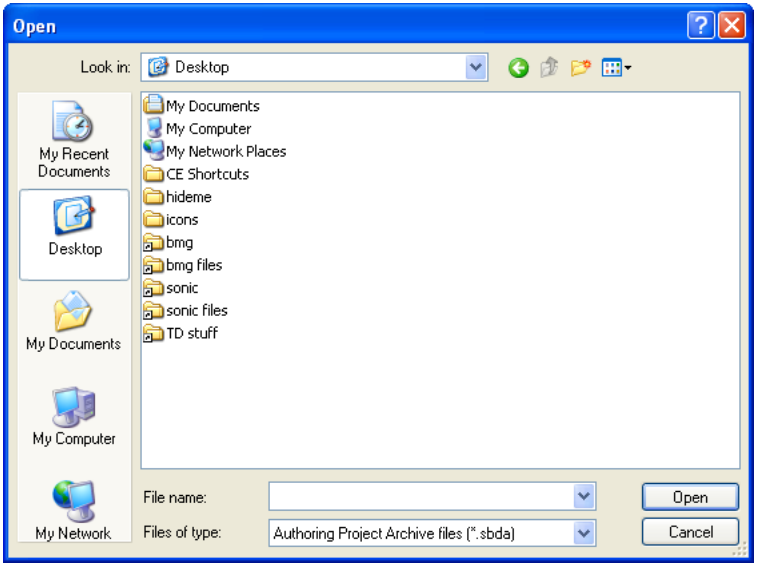
Extracting an archived project

To extract an archived project:

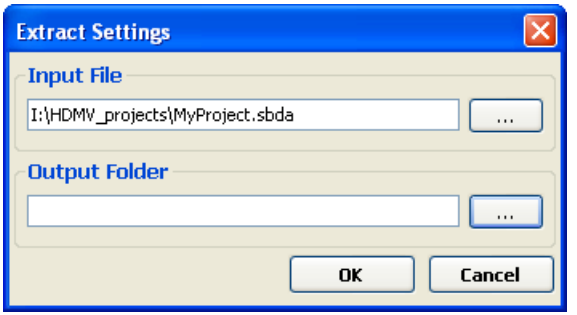
1 Within Scenarist BD, choose Tool > Extract. The Extract Settings dialog box appears.



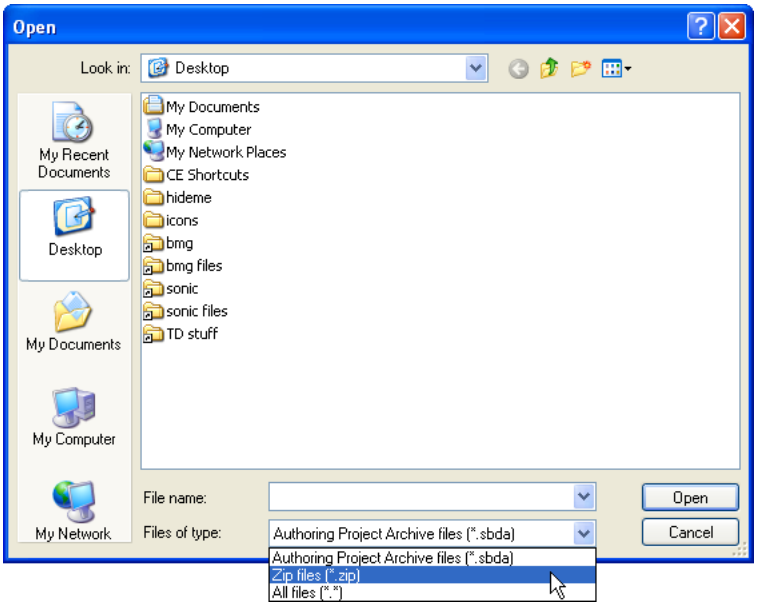
2 Click the Browse button to the right of the Input File field. The Open dialog box appears.



3 Locate your archive (.sbda) file; then click Open. The path to the archive file appears in the Input File field.



Note: If you created your archive with an earlier version of Scenarist BD, the file extension may be different (".zip" instead of ".sbda). In order for the Open dialog box to see this file, you need to select the appropriate file extension from the drop-down list.



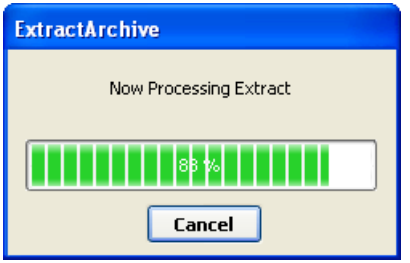
Note: Although this older file suffix is the same as that used with WinZip archives, the file does not have the same structure; it cannot be extract successfully using WinZip.

4 Click the Browse button to the right of the Output Folder field. The Browse for Folder dialog box appears.

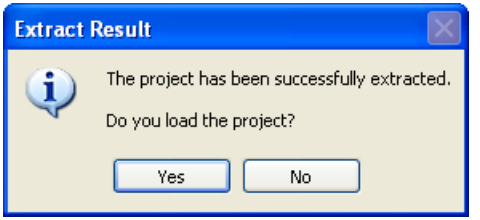
5 Select the location for the project. If you don't have an appropriate destination folder, click Make New Folder. A generic New Folder appears in the selected location.

6 Give the folder a name that matches your project.

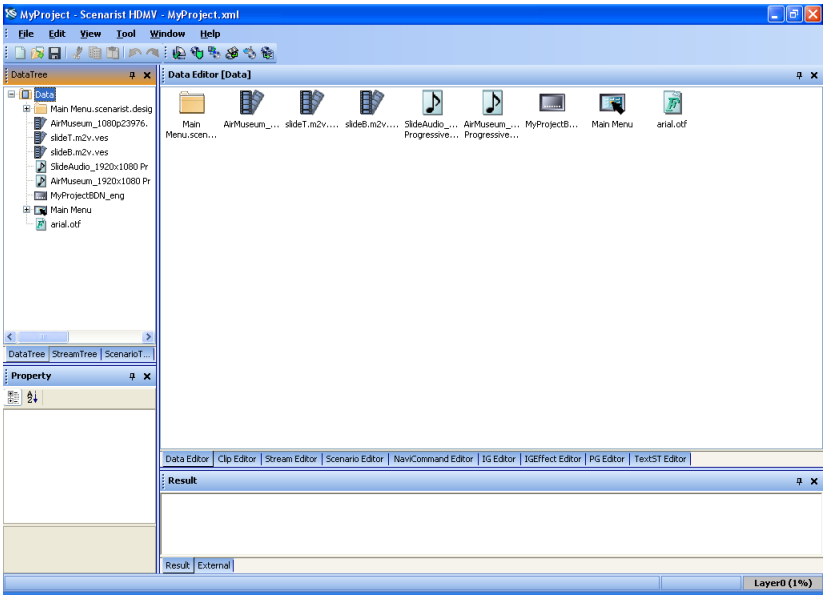
7 Click OK. Scenarist BD extracts the archive. The program shows you the progress of the extract operation.



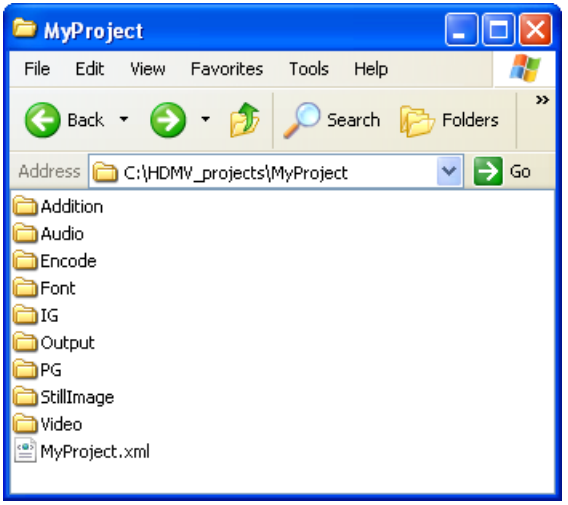
8 When the extract archive operation is finished, an Extract Result dialog box appears.



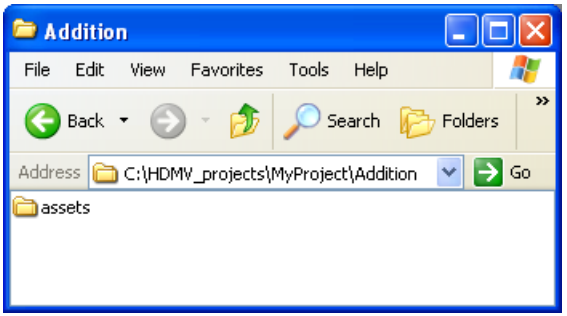
9 Click Yes. The project opens in Scenarist BD.



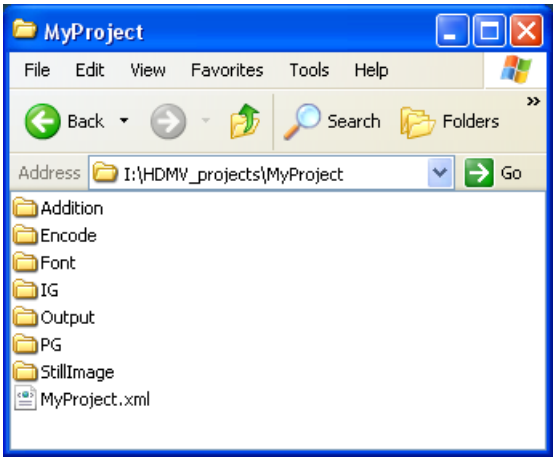
The destination folder contains folders for each element of the project.



The Addition folder contains the additional folder you selected during the archiving process.



Note: If you selected the "References the original audio and video files" option when you archived your project (see step 8 on page 423), there will not be "audio" and "video" element folders in your destination folder.



These assets are included in the project by reference only: The file paths for the audio and video streams (as saved in the archived and extracted project) have not been changed to point to the new destination folder.

A Keyboard shortcuts

This appendix documents the following keyboard shortcuts for Scenarist BD:

- "File menu shortcuts" on page 432
- "Edit menu shortcuts" on page 432
- "Tool menu shortcuts" on page 433
- "Editor window shortcuts" on page 433

File menu shortcuts

Keyboard Shortcut	Command
Ctrl+N	New Solution
Ctrl+O	Load Solution
Ctrl+S	Save Solution
Ctrl+W	Close Solution

Edit menu shortcuts

Keyboard Shortcut	Command
Ctrl+Z	Undo
Ctrl+Y	Redo
Ctrl+X	Cut
Ctrl+C	Copy
Ctrl+V	Paste
Delete	Delete Project
Ctrl+A	Select All
F2	Rename

Tool menu shortcuts

Keyboard Shortcut	Command
Ctrl+L	Disc Layout
Ctrl+M	MUX

Editor window shortcuts

Keyboard Shortcut	Command	Active windows
Ctrl+I	Zoom In	Scenario Editor, IG Editor, IGEffect Editor, PG Editor, TextST Editor, PiP Editor
Ctrl+U	Zoom Out	Scenario Editor, IG Editor, IGEffect Editor, PG Editor, TextST Editor, PiP Editor
Ctrl+R	Previous	IGEffect Editor, TextST Editor, PES Editor
Ctrl+T	Next	IGEffect Editor, TextST Editor, PES Editor

B Video and Audio specs for BD

This appendix provides video and audio specifications for BD. It contains the following topics:

- "BD Primary Video" on page 436
- "BD Secondary Video" on page 437
- "BD Primary Audio" on page 438
- "BD Secondary Audio" on page 439

BD Primary Video

BD Video Type	Frame Rate	Codec Available
Frame Size 1920 x 1080		**16:9 Ratio**
HD 1080 24p	23.976 progressive	MPEG-2, AVC, VC-1
HD 1080 60i	29.97 interlaced	MPEG-2, AVC, VC-1
HD 1080 50i	25 interlaced	MPEG-2, AVC, VC-1
Frame Size 1440x1080		**16:9 Ratio**
HD 1080 24p	23.976 progressive	AVC, VC-1
HD 1080 60i	29.97 interlaced	AVC, VC-1
HD 1080 50i	25 interlaced	AVC, VC-1
Frame Size 1280x720		**16:9 Ratio**
HD 720 24p	24 progressive	MPEG-2, AVC, VC-1
HD 720 60p	59.94 progressive	MPEG-2, AVC, VC-1
HD 720 50p	50 progressive	MPEG-2, AVC, VC-1
Frame Size 720x480		**16:9 or 4:3 Ratio**
SD 480 60i	29.97 interlaced	MPEG-2, AVC, VC-1
Frame Size 720x576		**16:9 or 4:3 Ratio**
SD 576 50i	25 interlaced	MPEG-2, AVC, VC-1

Note: 50i playback is mandatory only within areas that have HD and SD video transmission, such as Europe. Outside these areas, 50i support is optional; therefore, certain players will not play back 50i content outside these regions.

BD Secondary Video

- Unless the video codec used for the primary video is MPEG-2, the codec used for the secondary video must be the same as the codec used for the primary video.
- Both the primary and secondary video must use the same scan mode (interlaced or progressive).
- Both the primary and secondary video must use the same frame rate.

  Note: Secondary video allows for progressive SD video. Both 720 x 576 p25 and 720 x 480 p29.97 are available and allowed in secondary video only.
- If the primary and secondary video is 720x480 or 720x576, they must both have the same aspect ratio.
- Currently, players are not able to display full HD frame size in the secondary decoder. It is best to use SD frame size for secondary video to ensure widest compatibility.

BD Primary Audio

Max Channels	Bits per Sample	Sample Rate (kHz)
LPCM – (max transfer rate 27.748 Mbps)		
8 available with 48 and 96 kHz	16, 20, 24	48, 96, 192
6 available with 192 kHz		
DTS-HD Master Audio – (max transfer rate 24.5 Mbps)		
8 available with 48 and 96 kHz	16, 20, 24	48, 96, 192
6 available with 192 kHz		
Dolby Lossless – (max transfer rate 18.64 Mbps)		
8 available with 48 and 96 kHz	16, 20, 24	48, 96, 192
6 available with 192 kHz		
DTS Digital Surround – (max transfer rate 1.524 Mbps)		
6 (5.1 configuration)	16, 20, 24	48
Dolby Digital Plus – (max transfer rate 4.736 Mbps)		
8 (7.1 configuration)	16, 20, 24	48
Dolby Digital – (max transfer rate 0.64 Mbps)		
6 (5.1 configuration)	16, 20, 24	48

BD Secondary Audio

Max Channels	Bits per Sample	Sample Rate (kHz)
Dolby Digital Plus – (max transfer rate 256 Kbps)		
6 (5.1 configuration)	16, 20, 24	48
DTS-HD Master Audio LBR – (max transfer rate 256 Kbps)		
6 (5.1 configuration)	16, 20, 24	48

C Navigation principles

This appendix provides a primer of navigation principles for Scenarist BD.

Navigation principles for Scenarist BD

Note: To differentiate the principles from the commentary that accompanies them, each principle is presented in bold.

1 **The state of an IG can only be controlled or tracked during the time it is active in a PlayList. When it is not active, all PSRs related to the IG state will not necessarily be valid, nor is it guaranteed that you can set the page and button reliably.**

   Any code employed in the Movie object per the spec will be meaningless. Players cannot be counted on to execute this properly. Players are not required to play this correctly, but some have chosen to accommodate titles authored incorrectly.

   Note: In Scenarist HDMV 4.5.2, there is a bug that allows you to author and set a button page from a movie object.

   Any storing of GPRs related to button activation or selection must be done within the button object in the IG, and the setting of highlights must be done within a dummy button within the page or from a dummy page at ID=0 for the IG (see principle 3, below).

2 **You must leave the page to "Not Set" when setting button page to a button on the page you are currently on.**

   This is an anomaly within the spec that does not allow the same page to be set from a button on that page. Be careful when setting button highlights and pages using GPRs that you don't inadvertently do this.

3 **When a pop-up menu is activated, it always starts out on the 0 page.**

   PSRs for the title are all current, and can be read and stored or used for setting highlights, so this page is often used as a dummy page. (For those familiar with DVD authoring, this is similar to a precommand for the IG.)

4. **When an "Always On" Top Menu title is jumped to or called using the "Top Menu" remote function, or when you use a call system command from a pop-up menu to take you to a specific "Always On" menu in another title, the IG always starts from the 0 page (PAGE_ID = 0).**

5. **IG PSR values for button and highlight are lost the moment you leave the IG.**

6. **If Resume is suspended in the Title you are calling from, you can capture the back-up registers in the Movie Object for the Title you are calling to. These include the page and button highlight information for the last button selected or activated in that Title. (PlayItem and PlayListMark information is stored as well.)**

   Note: For more information, see Appendix D, ("Resuming in Scenarist BD" on page 445).

7. **"Jump" or "Call Title" commands will terminate execution of a list of button or Movie Object comments. The sequence of commands matters.**

8. **"Link MK," Link PI," Set Button Page," and Set Pop Up Off" commands will also terminate a command list.**

9. **A command enabling a button in the same BOG will not terminate the current Button Object command list.**

10. **Enabling a button in the same BOG will cause that button to be selected, but does not terminate the command list in the button you are currently executing.**

    The combination of principles 8, 9, and 10 means that you need to have multiple buttons in a BOG if you want to turn the pop-up menu off, or set another button page after linking to a chapter or a play item in the current PlayList. This requires you to set the newly enabled button to be auto-actioned with the command you wish to execute.

D Resuming in Scenarist BD

This appendix discusses how the resume function works in Scenarist BD. It contains the following topics:

- "Introduction" on page 446
- "Resuming from the Top Menu" on page 446
- "Resuming between Titles" on page 446
- "When suspended Movie Object is discarded" on page 447
- "Backup PSRs" on page 447

Introduction

Resuming in Scenarist BD is possible because the state of a Movie Object can be temporarily suspended while some other content is accessed. There are two situations in which resuming might occur, and each situation is controlled by a different authoring method.

Resuming from the Top Menu

This is the type of resuming that is found in DVD-Video. While watching the movie, the user can press a menu button on the remote, make some changes, and then press the menu button again to resume the film.

In Scenarist BD, it is possible to control whether resume information for a Movie Object is stored or not. There is a property called the resume_intention_flag, which can be set to Suspended or Discarded. If set to Suspended, it is possible to resume back into that Movie Object from the Top Menu. If set to Discarded, it will not be possible to resume back into the Movie Object from the Top Menu.

Resuming between Titles

This type of resuming is typically used with special features such as White Rabbit style pieces of bonus content.

Resuming between titles is made possible by the Call set of navigation commands, which suspend the current Movie Object when used. The Movie Object can then be re-accessed using the Resume command, which is located in either a Button or Movie Object command list.

The resume_intention_flag does not need to be set to Suspended for this type of resuming to work.

When suspended Movie Object is discarded

Only one Movie Object can be suspended at any one time, and can easily be discarded. The actions that cause current suspended Movie Object information to be discarded are:

- Resuming from the Top Menu to a suspended Movie Object.
- Resuming to a suspended Movie Object using the Resume command.
- Jumping to the TopMenu (using the remote). Jumping from a Movie Object set to Discarded will discard the current suspended Movie Object.
- Using a Jump navigation command.

Backup PSRs

Resume Information is stored in Backup PSRs:

PSR36 = Back-up Register for PSR4 (Title)

PSR37 = Back-up Register for PSR5 (Chapter)

PSR38 = Back-up Register for PSR6 (PlayList)

PSR39 = Back-up Register for PSR7 (PlayItem)

PSR40 = Back-up Register for PSR8 (Presentation Time)

PSR42 = Back-up Register for PSR10 (Selected Button)

PSR43 = Back-up Register for PSR11 (Menu Page)

E Troubleshooting IGs

This appendix discusses common problems you may encounter with IGs in Scenarist BD, and provides ways to deal with those problems. It contains the following topics:

- "Problem: IG does not show up on players" on page 450
- "Problem: IG buffer overflow" on page 450
- "Problem: IG buffer underflow" on page 452
- "Problem: IG size of any line after coding exceeds the size of the line before coding" on page 453

Problem: IG does not show up on players

There are a couple of things that can cause your IG not to show up on players. Here are some possibilities and tips:

1. You have included a button that has a SetButtonPage to highlight another button on the same page, and have either used GPRs to set the button and page or have specified the same page as that of the current button. If you find this to be the case, then make the "set page" part of the command be "not set".
2. One player has been found with firmware current as of June 19th, 2008, that may not display the IG if you have buttons or slices with transparent graphics. In some cases Scenarist Designer PS may export these without you knowing. The solution is *not* to use graphics set to transparent for dummy buttons. If this is not the case, you may have to search the IG for slices that have been set to be transparent, and delete them.
3. The safest way to create a dummy button is in Scenarist BD. Right-click on the Page in the data tree, select New Virtual Asset from the shortcut menu, and chose BOG. Then, right-click on the BOG, select New Virtual Asset from the shortcut menu, and select button. This creates a button with no graphics. These dummy BOGs can overlap. When you update the IG, dummy buttons with no graphics that contain valid button object commands will not be deleted.

Problem: IG buffer overflow

After you have encoded your menu asset, you may receive the following error when multiplexing, should your menu be too large to load into a player's buffer:

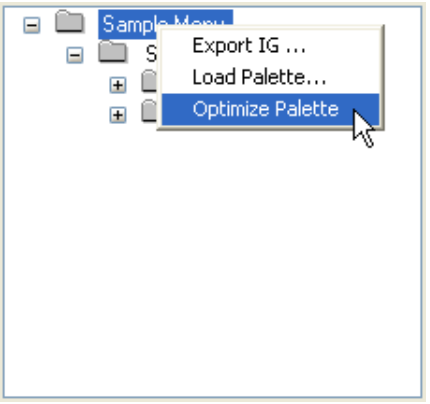
The Decoded Object Buffer(DB) overflows. limit size=16777216, occupancy size=24006595

There are several ways to fix this problem:

1. If possible, reduce the dimensions of the individual graphics (*i.e.*, make the width and height smaller).
2. Reduce the overall dimensions of the IG.
3. Reduce the number of colors you are using; in particular, try to remove any gradients.
4. Alter the dithering settings so that less dithering occurs.
5. Use a global palette for all pages, rather than one palette per page; this can save space, but may cause an adverse effect to the appearance of some graphics. Within Scenarist Designer PS you can optimize the palette to apply the same palette to all pages in your IG. When you encode the IG, Scenarist BD will automatically analyze all the images in the IG and include only unique data. This means that if you have shared graphics between pages, they will only be included once and referenced as many times as needed, thus reducing the overall size of the encoded IG.

To apply the same palette to all page in an IG:

- Right-click the top folder in the Tree View portion of the Scenarist Designer PS window, and select Optimize Palette from the shortcut menu.



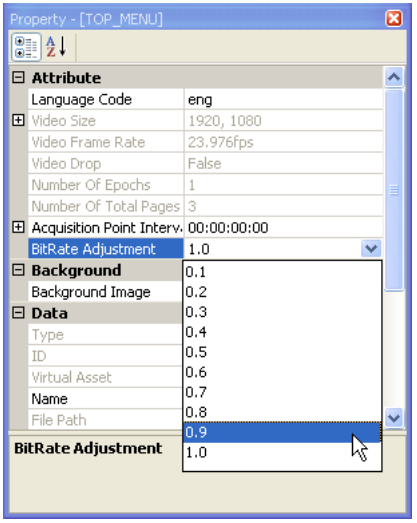
Problem: IG buffer underflow

A buffer underflow error may occur when data cannot be fed into the player's buffer quick enough for the player to play back all of the required data at the correct time. This may be caused by having a video stream with high target and maximum bitrates, and little difference between the two values. This increases the likelihood that data cannot be placed in the buffer fast enough, due to its limited size, resulting in the buffer running out of data during playback.

A buffer underflow error you may receive when multiplexing is:

> |ERROR|MUX_SN_E_TS_UNDERFLOW_ERR|E:\Projects\Hoops\Mux\MUX\Disc\DB\BDMV\STREAM/00001.m2ts|0|Buffer underflows|tswrapper.dll::CTSWrapper::ProcThreadMain::Graphics buffer underflows. - Failed to multiplex with maximum IG PTS: 54900000 (in 90kHz).|

To eliminate this, you can reduce your IG bitrate within Scenarist BD. (Note that this does not affect size.) Select the IG in the Data Tree; then go to the Properties window and change the BitRate Adjustment from 1.0 to a lower value, thus reducing the bitrate. Reducing this to 0.9 or 0.8 is often sufficient.

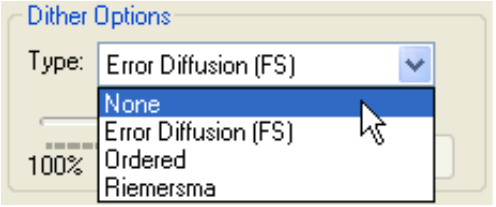


Problem: IG size of any line after coding exceeds the size of the line before coding

Occasionally Scenarist BD has a difficult time reducing the size of an IG when the run time encoding it applies to graphics imported from Designer. When this happens, you get this error:

> Error : The size of any line after coding exceeds the size of the line before coding (the 'uncompressed' line) plus 16 (for coding overhead). LINE=1017, SIZE(rle_coded_line())=22608, SIZE(uncompressed_line())=15360"

If this IG has been exported from Scenarist Designer PS, it may be that some form of dithering is turned on; this can be the cause of the problem in some cases. Try turning the dithering off: Once you have exported the file from Photoshop into Designer, in the Dither Options drop-down list, choose None.



There are some things you can do to simplify an image that can help avoid this problem. Primarily, you want to avoid gradients in the image; also, avoid using very complex images with many small details.

454 Problem: IG size of any line after coding exceeds the size of the line before coding

F Region coding in Scenarist BD

This appendix explains how region coding works in Scenarist BD. It contains the following topics:

- "Introduction" on page 456
- "PSR20: Region Code" on page 456

Introduction

The way in which Region Coding works in BD is not the same as it did in DVD. When creating a DVD title, you would specify the valid regions before pre-mastering, and the players themselves would decide whether to restrict access based on this and their own internal region code. In BD you can still specify the target regions (A, B or C) when pre-mastering. However players do not automatically restrict access based on their internal region code, this functionality must be authored instead.

Having control over what the player does based on its region adds the ability to:

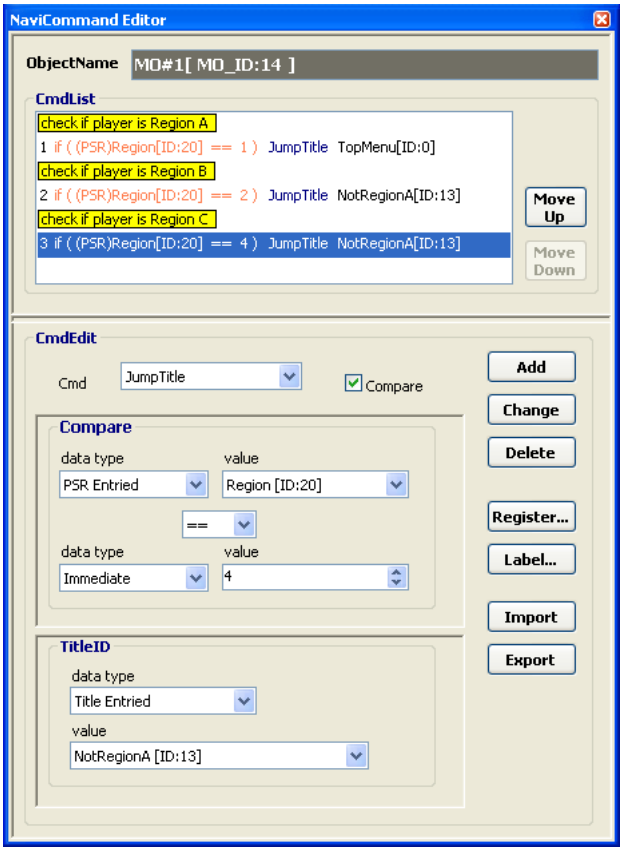
- have custom “wrong region” content.
- play back different versions of the same content depending on the players region.

PSR20: Region Code

A player’s region code is contained in PSR 20. This PSR is read-only; it cannot be changed by Scenarist BD navigation commands or a BD-J application. The possible values are as follows:

Decimal	Binary	Region
1	0000 0001	A
2	0000 0010	B
4	0000 0100	C

Here is an example NaviCommand list that checks the player's region and then jumps to the appropriate title:



In this case it is also necessary to set the Menu Call Mask and Title Search Mask properties of both the FirstPlay and NotRegionA Player Movie Objects to Prohibited.

G BDCMF types

This appendix describes the various types of BDCMF (Blu-ray Disc Cutting Master Format).

BDCMF types

Blu-ray Disc BDCMF (Blu-ray Disc Cutting Master Format) can have a number of types. Scenarist BD creates only Type A, and supports Step 0 in Type V. Here is a list of the different types:

Type V (as Virtual Machine) Refers to Step 0 of BD+ process, and is transmitted to an Eligible Content code Developer (Macrovision), which performs BD+ processing. Never transmitted to Replicator who does not perform BD+ processing.

Type A Flagged for encryption, not signed by AACS, no ROM-Mark applied. It is the basic format of BDCMF transmitted to a replication facility. Also is step 1 of BD+ process when it is transmitted to the replicator.

Type B Encrypted, not signed by AACS, no ROM-Mark applied. Done by replicators, and used to request signature from AACS LA.

Type C Encrypted, Signed by AACS, no ROM-Mark applied. Used to transmit data between replication facilities. There are two types, C1 and C2. C2 is not applicable to Authoring houses.

Type D Encrypted, Signed by AACS, ROM-Mark applied. It is the internal format of the replication facility.

Type P Refers to the ROM content (non-movie content) to be transmitted to a replication facility. Sonic does not have a tool at this time that supports this type of ROM-only BDCMF.

Encryption is handled by replication tools, such as Eclipse.

H Country codes

This appendix provides a comprehensive list of country codes applicable to Scenarist BD.

Country codes

Below is a comprehensive list of country codes relevant to PSR19: Country Code.

COUNTRY	ABBREVIATION	COUNTRY CODE
NOT SPECIFIED	NOT SPECIFIED	65535
AFGHANISTAN	AF	16710
ALBANIA	AL	16716
ALGERIA	DZ	17498
AMERICAN SAMOA	AS	16723
ANDORRA	AD	16708
ANGLOA	AO	16719
ANGUILLA	AI	16713
ANTARTICA	AQ	16721
ANTIGUA AND BARBUDA	AG	16711
ARGENTINA	AR	16722
ARMENIA	AM	16717
ARUBA	AW	16727
AUSTRALIA	AU	16725
AUSTRIA	AT	16724
AZERBAIJAN	AZ	16730
BAHAMAS	BS	16979
BAHRAIN	BH	16968
BANGLADESH	BD	16964
BARBADOS	BB	16962
BELARUS	BY	16985
BELGIUM	BE	16965

COUNTRY	ABBREVIATION	COUNTRY CODE
BELIZE	BZ	16986
BENIN	BJ	16970
BERMUDA	BM	16973
BHUTAN	BT	16980
BOLVIA	BO	16975
BOSNIA AND HERZEGOVINA	BA	16961
BOTSWANA	BW	16983
BOUVET ISLAND	BV	16982
BRAZIL	BR	16978
BRITISH INDIAN OCEAN TERRITORY	IO	18767
BRUNEIDARUSSALAM	BN	16974
BULGARIA	BG	16967
BURKINA FASO	BF	16966
BURUNDI	BI	16969
CAMBODIA	KH	19272
CAMEROON	CM	17229
CANADA	CA	17217
CAPE VERDE	CV	17238
CAYMEN ISLANDS	KY	19289
CENTRAL AFRICAN REPUBLIC	CF	17222
CHAD	TD	21572
CHILE	CL	17228
CHINA	CN	17230
CHRISTMAS ISLAND	CX	17240

COUNTRY	ABBREVIATION	COUNTRY CODE
COCOS (KEELING) ISLANDS	CC	17219
COLOMBIA	CO	17231
COMOROS	KM	19277
CONGO	CG	17223
CONGO, THE DEMOCRATIC REPUBLIC	CD	17220
COOK ISLANDS	CK	17227
COSTA RICA	CR	17234
COTE D'IVOIRE	CI	17225
CROATIA	HR	18514
CUBA	CY	17241
CYPRUS	CV	17238
CZECH REPUBLIC	CZ	17242
DENMARK	DK	17483
DJIBOUTI	DJ	17482
DOMINICA	DM	17485
DOMINICAN REPUBLIC	DO	17487
EAST TIMOR	TP	21584
ECUADOR	EC	17731
EGYPT	EG	17735
EL SALVADOR	SV	21334
EQUATORIAL GUINEA	GQ	18257
ERUTEA	ER	17746
ESTONIA	EE	17733
ETHIOPIA	ET	17748

COUNTRY	ABBREVIATION	COUNTRY CODE
FALKLAND ISLAND (MALDIVES)	FK	17748
FAROE ISLANDS	FO	17999
FIJI	FJ	17994
FINLAND	FI	17993
FRANCE	FR	18002
FRENCH GUIANA #	GF	18246
FRENCH POLYNESIA	PF	20550
FRENCH SOUTHERN TERRITORIES	TF	21574
GABON	GA	18241
GAMBIA	GM	18253
GEORGIA #	GE	18245
GERMANY	DE	17477
GHANA	GH	18248
GIBRALTAR	GI	18249
GREECE	GR	18258
GREENLAND	GL	18252
GRENADA	GD	18244
GUADELOUPE #	GP	18256
GUAM	GU	18261
GUATEMALA	GT	18260
GUINEA	GN	18254
GUINEA-BISSAU	GW	18263
GUYANA	GY	18265
HAITI	HT	18516
HEARD ISLAND AND MCDONALD	HM	18509

COUNTRY	ABBREVIATION	COUNTRY CODE
HOLY SEE (VATICAN CITY STATE#)	VA	22081
HONDURAS	HN	18510
HONG KONG	HK	18507
HUNGARY	HU	18517
ICELAND	IS	18771
INDIA	IN	18766
INDONESIA	ID	18756
IRAN, ISLAMIC REPUBLIC OF#	IR	18770
IRAQ	IQ	18769
IRELAND	IE	18757
ISRAEL	IL	18764
ITALY	IT	18772
JAMAICA	JM	19021
JAPAN	JP	19024
JORDAN	JO	19023
KAZAKSTAN#	KZ	19290
KENYA	KE	19269
KIRIBATI	KI	19273
KOREA, DEMOCRATIC PEOPLE'S REPUBLIC OF	KP	19280
KOREA, REPUBLIC OF	KR	19282
KUWAIT	KW	19287
KYRGYZSTAN	KG	19271
LAO PEOPLE'S DEMOCRATIC REPUBLIC	LA	19521
LATVIA	LV	19542

COUNTRY	ABBREVIATION	COUNTRY CODE
LEBANON	LB	19522
LESOTHO	LS	19539
LIBERIA	LR	19538
LIBYAN ARAB JAMAHIRIYA	LY	19545
LIECHTENSTEIN	LI	19529
LITHUANIA	LT	19540
LUXEMBOURG	LU	19541
MACAU	MO	19791
MACEDONIA	MK	19787
MADAGASCAR	MG	19783
MALAWI	MW	19799
MALAYSIA	MY	19801
MALDIVES	MV	19798
MALI	ML	19788
MALTA	MT	19796
MARSHALL ISLANDS	MH	19784
MARTINIQUE#	MQ	19793
MAURITANIA	MR	19794
MAURITIUS	MU	19797
MAYOTTE#	YT	22868
MEXICO	MX	19800
MICRONESIA	FM	17997
MOLDOVA, REPUBLIC OF	MD	19780
MONACO	MC	19779
MONGULIA	MN	19790

COUNTRY	ABBREVIATION	COUNTRY CODE
MONTSERRAT	MS	19795
MOROCCO	MA	19777
MOZAMBIQUE	MZ	19802
MYANMAR	MM	19789
NAMIBIA	NA	20033
NAURU	NR	20050
NEPAL	NP	20048
NETHERLANDS	NL	20044
NETHERLANDS ANTILLES	AN	16718
NEW CALADONIA	NC	20035
NEW ZEALAND	NZ	20058
NICARAGUA	NI	20041
NIGER	NE	20037
NIGERIA	NG	20039
NIUE	NU	20053
NORFOLK ISLAND	NF	20038
NORTHERN MARIANA ISLANDS	MP	19792
NORMAY	NO	20047
OMAN	OM	20301
PAKISTAN	PK	20555
PALAU	PW	20567
PANAMA	PA	20545
PAPUA NEW GUINEA	PG	20551
PARAGUAY	PY	20569
PERU	PE	20549

COUNTRY	ABBREVIATION	COUNTRY CODE
PHILIPPINES	PH	20552
PITCAIRN	PN	20558
POLAND	PL	20556
PORTUGAL	PT	20564
PUERTO RICO	PR	20562
QATAR	QA	20801
REUNION#	RE	21061
ROMANIA	RO	21071
RUSSIAN FEDERATION	RU	21077
RWANDA	RW	21079
SAINT HELENA	SH	21320
SAINT KITTS AND NEVIS	KN	19278
SAINT LUCIA	LC	19523
SAINT PIERRE AND MIQUELON#	PM	20557
SAINT VINCENT AND THE GRENADE	VC	22083
SAMOA	WS	22355
SAN MARINO	SM	21325
SAO TOME AND PRINCIPE	ST	21332
SAUDI ARABIA	SA	21313
TANZANIA, UNITED REPUBLIC OF	TZ	21594
THAILAND	TH	21576
TOGO	TG	21575
TOKELAU	TK	21579
TONGA	TO	21583

COUNTRY	ABBREVIATION	COUNTRY CODE
TRINIDAD AND TOBAGO	TT	21588
TUNISIA	TN	21582
TURKEY	TR	21586
TURKMENISTAN	TM	21581
TURKS AND CAICOS ISLANDS	TC	21571
TUVALU	TV	21590
UGANDA	UG	21830
UKRAINE	UA	21825
UNITED ARAB EMIRATES	AE	16709
UNITED KINGDOM	GB	18242
UNITED STATES	US	21843
UNITED STATES MINOR OUTLYING	UM	21837
URUGUAY	UY	21849
UZBEKISTAN	UZ	21850
VANUATU	VU	22101
VENEZUELA	VE	22085
VIET NAM	VN	22094
VIRGIN ISLANDS, BRITISH#	VG	22087
VIRGIN ISLANDS, U.S.#	VI	22089
WALLIS AND FUTUNA#	WF	22342
WESTERN SAHARA	EH	17736
YEMEN	YE	22853
YUGOSLAVIA	YU	22869
ZAMBIA	ZM	23117
ZIMBABWE	ZW	23127

I Language codes

This appendix provides a comprehensive list of language codes applicable to Scenarist BD.

Language codes

Below is a comprehensive list of language codes relevant to the following PSRs:

- PSR16: Language Code for Audio.
- PSR17: Language Code for PGs and TextSTs.
- PSR18: Menu Description Language Code.

COUNTRY	ABBREVIATION	COUNTRY CODE
Abkhazian	abk	6382187
Achinese	ace	6382437
Acoli	ach	6382440
Adangme	ada	6382689
Afar	aar	6381938
Afrihili	afh	6383208
Afrikaans	afr	6383218
Afro-Asiatic (Other)	afa	6383201
Akan	aka	6384481
Akkadian	akk	6384491
Albanian	alb	6384738
Aleut	ale	6384741
Algonquian languages	alg	6384743
Altaic (Other)	tut	7632244
Amharic	amh	6385000
Apache languages	apa	6385761
Arabic	ara	6386273
Aramaic	arc	6386275

COUNTRY	ABBREVIATION	COUNTRY CODE
Arapaho	arp	6386288
Araucanian	arn	6386286
Arawak	arw	6386295
Armenian	arm	6386285
Artificial (Other)	art	6386292
Assamese	asm	6386541
Athapascan languages	ath	6386792
Austronesian (Other)	map	7168368
Avaric	ava	6387297
Avestan	ave	6387301
Awadhi	awa	6387553
Aymara	aym	6388077
Azerbaijani	aze	6388325
Aztec	nah	7233896
Balinese	ban	6447470
Baltic (Other)	bat	6447476
Baluchi	bal	6447468
Bambara	bam	6447469
Bamileke languages	bai	6447465
Banda	bad	6447460
Bantu (Other)	bnt	6450804
Basa	bas	6447475
Bashkir	bak	6447467
Basque	baq	6447473
Beja	bej	6447466

COUNTRY	ABBREVIATION	COUNTRY CODE
Bemba	bem	6448493
Bengali	ben	6448494
Berber (Other)	ber	6448498
Bhojpuri	bho	6449263
Bihari	bih	6449512
Bikol	bik	6449515
Bini	bin	6449518
Bislama	bis	6449523
Braj	bra	6451809
Breton	bre	6451813
Buginese	bug	6452583
Bulgarian	bul	6452588
Buriat	bua	6452577
Burmese	bur	6452594
Byelorussian	bel	6448492
Caddo	cad	6512996
Carib	car	6513010
Catalan	cat	6513012
Caucasian (Other)	cau	6513013
Cebuano	ceb	6514018
Celtic (Other)	cel	6514028
Central American Indian	cai	6513001
Chagatai	chg	6514791
Chamorro	cha	6514785
Chechen	che	6514789

COUNTRY	ABBREVIATION	COUNTRY CODE
Cherokee	chr	6514802
Cheyenne	chy	6514809
Chibcha	chb	6514786
Chinese	zho	6514793
Chinook jargon	chn	6514798
Choctaw	cho	6514799
Church Slavic	chu	6514805
Chuvash	chv	6514806
Coptic	cop	6516592
Cornish	cor	6516594
Corsican	cos	6516595
Cree	cre	6517349
Creek	mus	7173491
Creoles and Pidgins (Other)	crp	6517360
Creoles and Pidgins, English-based (Other)	cpe	6516837
Creoles and Pidgins, French-based (Other)	cpf	6516838
Creoles and Pidgins, Portuguese-based (Other)	cpp	6516848
Cushitic (Other)	cus	6518131
Croatian	scr	7562098
Czech	ces	6514035
Dakota	dak	6578539
Danish	dan	6578542
Delaware	del	6579564
Dinka	din	6580590
Divehi	div	6580598

COUNTRY	ABBREVIATION	COUNTRY CODE
Dogri	doi	6582121
Dravidian (Other)	dra	6582881
Duala	dua	6583649
Dutch	dut	6583668
Dutch, Middle (ca. 1050-1350)	dum	6583661
Dyula	dyu	6584693
Dzongkha	dzo	6584943
Efik	efi	6645353
Egyptian (Ancient)	egy	6645625
Ekajuk	eka	6646625
Elamite	elx	6646904
English	eng	6647399
English, Middle (ca. 1100-1500)	enm	6647405
English, Old (ca. 450-1100)	ang	6385255
Eskimo (Other)	esk	6648683
Esperanto	epo	6647919
Estonian	est	6648692
Ewe	ewe	6649701
Ewondo	ewo	6649711
Fang	fan	6709614
Fanti	fat	6709620
Faroese	fao	6709615
Fijian	fij	6711658
Finnish	fin	6711662
Finno-Ugrian (Other)	fiu	6711669

COUNTRY	ABBREVIATION	COUNTRY CODE
Fon	fon	6713198
French	fra	6713953
French, Middle (ca. 1400-1600)	frm	6713965
French, Old (842- ca. 1400)	fro	6713967
Frisian	fry	6713977
Fulah	ful	6714732
Ga	gaa	6775137
Gaelic (Scots)	gae	6775141
Gallegan	glg	6777959
Ganda	lug	7107943
Gayo	gay	6775161
Geez	gez	6776186
Georgian	geo	6776175
German	deu	6579573
German, Middle High (ca. 1050-1500)	gmh	6778216
German, Old High (ca. 750-1050)	goh	6778728
Germanic (Other)	gem	6776173
Gilbertese	gil	6777196
Gondi	gon	6778734
Gothic	got	6778740
Grebo	grb	6779490
Greek, Ancient (to 1453)	grc	6779491
Greek, Modern (1453-)	ell	6646892
Greenlandic	kal	7037292
Guarani	grn	6779502

COUNTRY	ABBREVIATION	COUNTRY CODE
Gujarati	guj	6780266
Haida	hai	6840681
Hausa	hau	6840693
Hawaiian	haw	6840695
Hebrew	heb	6841698
Herero	her	6841714
Hiligaynon	hil	6842732
Himachali	him	6842733
Hindi	hin	6842734
Hiri Motu	hmo	6843759
Hungarian	hun	6845806
Hupa	hup	6845808
Iban	iba	6906465
Icelandic	isl	4805452
Igbo	ibo	6906479
Ijo	ijo	6908527
Iloko	ilo	6909039
Indic (Other)	inc	6909539
Indo-European (Other)	ine	6909541
Indonesian	ind	6909540
Interlingua (International Auxiliary language Assoc.)	ina	6909537
Interlingue	ine	6909541
Inuktitut	iku	6908789
Inupiak	ipk	6910059
Iranian (Other)	ira	6910561

COUNTRY	ABBREVIATION	COUNTRY CODE
Irish	gai	6775145
Irish, Old (to 900)	sga	7563105
Irish, Middle (900 -1200)	mga	7169889
Iroquoian languages	iro	6910575
Italian	ita	6911073
Japanese	jpn	6975598
Javanese	jav	6971766
Judeo-Arabic	jrb	6976098
Judeo-Persian	jpr	6975602
Kabyle	kab	7037291
Kachin	kac	7037283
Kamba	kam	7037293
Kannada	kan	7037294
Kanuri	kau	7037301
Kara-Kalpak	kaa	7037281
Karen	kar	7037298
Kashmiri	kas	7037299
Kawi	kaw	7037303
Kazakh	kaz	7037306
Khasi	kha	7039073
Khmer	khm	7039085
Khoisan (Other)	khi	7039081
Khotanese	kho	7039087
Kikuyu	kik	7039339
Kinyarwanda	kin	7039342

COUNTRY	ABBREVIATION	COUNTRY CODE
Kirghiz	kir	7039346
Komi	kom	7040877
Kongo	kon	7040878
Konkani	kok	7040875
Korean	kor	7040882
Kpelle	kpe	7041125
Kru	kro	7041647
Kuanyama	kua	7042401
Kumyk	kum	7042413
Kurdish	kur	7042418
Kurukh	kru	7041653
Kusaie	kus	7042419
Kutenai	kut	7042420
Ladino	lad	7102820
Lahnda	lah	7102824
Lamba	lam	7102829
Langue d'Oc (post 1500)	oci	7299945
Lao	lao	7102831
Latin	lat	7102836
Latvian	lav	7102838
Letzeburgesch	ltz	7107706
Lezghian	lez	7103866
Lingala	lin	7104878
Lithuanian	lit	7104884
Lozi	loz	7106426

COUNTRY	ABBREVIATION	COUNTRY CODE
Luba-Katanga	lub	7107938
Luiseno	lui	7107945
Lunda	lun	7107950
Luo	luo	7107951
Macedonian	mac	7168355
Madurese	mad	7168356
Magahi	mag	7168359
Maithili	mai	7168361
Makasar	mak	7168363
Malagasy	mlg	7171175
Malay	may	7168377
Malayalam	mal	7168364
Maltese	mlt	7171188
Mandingo	man	7168366
Manipuri	mni	7171689
Manobo languages	mno	7171695
Manx	max	7168376
Maori	mao	7168367
Marathi	mar	7168370
Mari	chm	6514797
Marshall	mah	7168360
Marwari	mwr	7174002
Masai	mas	7168371
Mayan languages	myn	7174510
Mende	men	7169390

COUNTRY	ABBREVIATION	COUNTRY CODE
Micmac	mic	7170403
Minangkabau	min	7170414
Miscellaneous (Other)	mis	7170419
Mohawk	moh	7171944
Moldavian	mol	7171948
Mon-Kmer (Other)	mkh	7170920
Mongo	lol	7106412
Mongolian	mon	7171950
Mossi	mos	7171955
Multiple languages	mul	7173484
Munda languages	mun	7173486
Nauru	nau	7233909
Navajo	nav	7233910
Ndebele, North	nde	7234661
Ndebele, South	nbl	7234156
Ndongo	ndo	7234671
Nepali	nep	7234928
Newari	new	7234935
Niger-Kordofanian (Other)	nic	7235939
Nilo-Saharan (Other)	ssa	7566177
Niuean	niu	7235957
Norse, Old	non	7237465
North American Indian (Other)	nai	7233897
Norwegian	nor	7237490
Norwegian (Nynorsk)	Nno	7237231

COUNTRY	ABBREVIATION	COUNTRY CODE
Nubian languages	nub	7239010
Nyamwezi	nym	7240045
Nyanja	nya	7240033
Nyankole	nyn	7240046
Nyoro	nyo	7240047
Nzima	nzi	7240297
Ojibwa	oji	7301737
Oriya	ori	7303785
Oromo	orm	7303789
Osage	osa	7304033
Ossetic	oss	7304051
Otomian languages	oto	7304303
Pahlavi	pal	7364972
Palauan	pau	7364981
Pali	pli	7367785
Pampanga	pam	7364973
Pangasinan	pag	7364967
Panjabi	pan	7364974
Papiamento	pap	7364976
Papuan-Australian (Other)	paa	7364961
Persian	fas	6709619
Persian, Old (ca 600-400 B.C.)	peo	7365999
Phoenician	phn	7366766
Polish	pol	7368556
Ponape	pon	7368558

COUNTRY	ABBREVIATION	COUNTRY CODE
Portuguese	por	7368562
Prakrit languages	pra	7369313
Provencal, Old (to 1500)	pro	7369327
Pushto	pus	7370099
Quechua	que	7435621
Rhaeto-Romance	roh	7499624
Rajasthani	raj	7496042
Rarotongan	rar	7496050
Romance (Other)	roa	7499617
Romanian	ron	7499630
Romany	rom	7499629
Rundi	run	7501166
Russian	rus	7501171
Salishan languages	sal	7561580
Samaritan Aramaic	sam	7561581
Sami languages	smi	7564649
Samoan	smo	7564655
Sandawe	sad	7561572
Sango	sag	7561575
Sanskrit	san	7561582
Sardinian	srd	7565924
Scots	sco	7562095
Selkup	sel	7562604
Semitic (Other)	sem	7562605
Serbian	scc	7562083

COUNTRY	ABBREVIATION	COUNTRY CODE
Serbo-Croatian	scr	7562098
Serer	srr	7565938
Shan	shn	7563374
Shona	sna	7564897
Sidamo	sid	7563620
Siksika	bla	6450273
Sindhi	snd	7564900
Singhalese	sin	7563630
Sino-Tibetan (Other)	sit	7563636
Siouan languages	sio	7563631
Slavic (Other)	sla	7564385
Siswant	ssw	7566199
Slovak	slk	7564395
Slovenian	slv	7564406
Sogdian	sog	7565159
Somali	som	7565165
Songhai	son	7565166
Sorbian languages	wen	7824750
Sotho, Northern	nso	7238511
Sotho, Southern	sot	7565172
South American Indian (Other)	sai	7561577
Spanish	spa	6648684
Sukuma	suk	7566699
Sumerian	sux	7566712
Sudanese	sun	7566702

COUNTRY	ABBREVIATION	COUNTRY CODE
Susu	sus	7566707
Swahili	swa	7567201
Swazi	ssw	7566199
Swedish	swe	5461829
Syriac	syr	7567730
Tagalog	tgl	7628652
Tahitian	tah	7627112
Tajik	tgk	7628651
Tamashek	tmh	7630184
Tamil	tam	7627117
Tatar	tat	7627124
Telugu	tel	7628140
Tereno	ter	7628146
Thai	tha	7628897
Tibetan	bod	6451044
Tigre	tig	7629159
Tigrinya	tir	7629170
Timne	tem	7628141
Tivi	tiv	7629174
Tlingit	tli	7629929
Tonga (Nyasa)	tog	7630695
Tonga (Tonga Islands)	ton	7630702
Truk	tru	7631477
Tsimshian	tsi	7631721
Tsonga	tso	7631727

COUNTRY	ABBREVIATION	COUNTRY CODE
Tswana	tsn	7631726
Tumbuka	tum	7632237
Turkish	tur	7632242
Turkish, Ottoman (1500-1928)	ota	7304289
Turkmen	tuk	7632235
Tuvinian	tyv	7633270
Twi	twi	7632745
Ugaritic	uga	7694177
Uighur	uig	7694695
Ukrainian	ukr	7695218
Umbundu	umb	7695714
Undetermined	und	7695972
Urdu	urd	7696996
Uzbek	uzb	7699042
Va	vai	7758185
Venda	ven	7759214
Vietnamese	vie	7760229
Volapük	vol	7761772
Votic	vot	7761780
Wakashan languages	wak	7823723
Walamo	wal	7823724
Waray	war	7823730
Washo	was	7823731
Welsh	cym	6519149
Wolof	wol	7827308

COUNTRY	ABBREVIATION	COUNTRY CODE
Xhosa	xho	7891055
Yakut	sah	7561576
Yao	yao	7954799
Yap	yap	7954800
Yiddish	yid	7956836
Yoruba	yor	7958386
Zapotec	zap	8020336
Zenaga	zen	8021358
Zhuang	zha	8022113
Zulu	zul	8025452
Zuni	zun	8025454